The Newspaper of Information Systems Management
December 20, 1993, Vol. 27, No. 51, 104 Pages, $6/Copy, $48/Year

COMPUTERWORLD

Feds try to renovate by rebuilding E-mail

By Gary H. Anthes
WASHINGTON

An electronic-mail message sent from the General Services Administration to the Environmental Protection Agency, just a few blocks away, moves from a GSA LAN to a Sprint Corp. communications center in Reston, Va. It arrives at an AT&T facility near Brunswick, N.J., only to be sent back to the EPA here, passing through several gateways en route.

GSA's Michael Corrigan

The odds are reasonably good that neither snow nor rain nor system crashes will keep the message from completing its appointed round. However, this is not exactly the scheme on which President Clinton would build a government-wide E-mail infrastructure.

Boosted by the president's "reinventing government" effort, E-mail initiatives are sprouting up all over Washington as federal officials increasingly view mail-enabled applications — electronic commerce, electronic filing and interpersonal messaging, for example — as a key way to make government more efficient and responsive.

"As in the business world, electronic messaging is becoming es-

E-mail, *page 24*

Chicago bulls ahead

Microsoft aims high; developers decry API shortcomings

By Stuart J. Johnston
and Ed Scannell

■ Microsoft Corp. officials, laying out operating systems strategies for 5,000 developers last week, boldly predicted that 50 million copies of Windows 4.0 will ship the first year the product is available.

But with the product, code-named Chicago, still awaiting a finished set of application programming interfaces, some developers attending Microsoft's Professional Developers Conference in Anaheim, Calif., were uncomfortable with how and when they should begin the development process.

Consequently, developers may drag their feet on building applications, resulting in fewer programs that exploit Chicago's 32-bit multitasking and multithreading capabilities when the operating system ships sometime in the second half of next year, attendees said.

Selling 50 million copies of Chicago by 1995 will be quite a feat. Microsoft has sold 45 million copies of Windows since its 1985 inception, according to International Data Corp. in Framingham, Mass.

"I think you've got a floor full of people out there who [were not] sure whether they will have apps ready [when Chicago ships]," said one industry observer who attended the conference.

"Microsoft is saying, 'Here is the future,' but a lot of the APIs have not been settled yet," said a developer at the conference, which required nondisclosure agreements of attendees. "Alpha II [the latest test version of Chicago, released last week] is a nice exercise, but it doesn't tell me squat about what I should be doing with the next version of my application."

Seeking NT features

At least one corporate developer confronted Microsoft officials about the need to provide a feature similar to Windows NT's individual user profiles to accommodate multiple users on a single machine. The individual profile allows PC managers to customize a broad range of system settings and which applications will start as the operating system loads.

Chicago, *page 16*

Novell closes up Unix manager

By Elisabeth Horwitt

Novell, Inc. is attempting to foist a proprietary management system onto Unix System V Release 4 and UnixWare, reneging on promises to keep these systems truly open, said user, analyst and vendor sources last week.

**"Once again, Novell is not paying attention to trends in industry."
— Brian Anderson, CIO, Transocean Ltd.**

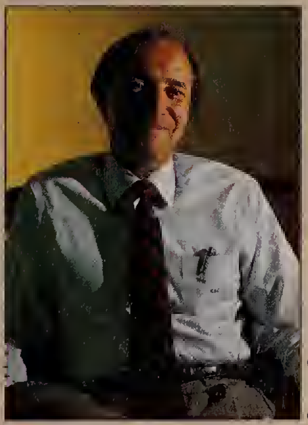
To push Unix customers and OEMs to support its NetWare Management System, Novell quietly withdrew support this fall for Distributed Manager.

Distributed Manager is a Unix systems management platform that Novell's recently acquired Unix Systems Group had been in the process of developing with several partners, including Unisys Corp. and Siemens/Nixdorf Informationssysteme AG.

Novell has been talking about providing UnixWare management through NetWare Distributed Management Services, the upcoming upgrade to NMS, since NDMS was announced this fall. What irks vendors and users is Novell's apparent reversal on support for efforts by Unix industry members, including its own subsidiary, to come up with a common management platform specifically tailored to the Unix environment.

Novell, *page 10*

BENCHMARKING on empty


CHARLIE SAMUELS

Pfizer's Claude Christiano

IS YOUR BENCHMARKING EFFORT REALLY JUST INDUSTRIAL TOURISM? If your IS organization is repeating the mistakes that Texas Instruments, Pfizer and others have made, you aren't on the highway to a high-performance organization — you're just puttering down a dead-end street.

SEE MANAGEMENT, PAGE 73.

Technology's helping hand

Food banks automate to feed the hungry

By Johanna Ambrosio

As America's hungry queue up at soup kitchens and shelters this holiday season, technology will play a substantial role in helping to feed them.

"I can't imagine running a holiday without a computer," said Debbie O'Connell, assistant coordinator of the Hunger Hotline at Project Bread, a food bank in Boston.

With the help of one computer with a database, the hot line will help match 540,000 individuals with shelters and soup kitchens in their neighborhoods between Thanksgiving and Christmas this year. Computers "save so much work, and they free up time to do more important things like take more

Food banks, *page 12*

STELLA JOHNSON

▲ **Gracie Keeza** *serves guests at Rosie's Place, a women's shelter in Boston*

Newspaper

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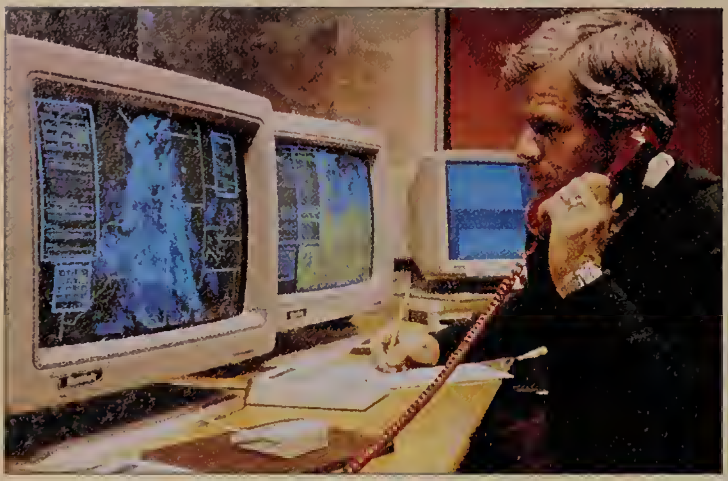
Table of Contents

December 20, 1993



WORKGROUP COMPUTING

■The National Weather Service is investing $4 billion nationwide in an overhaul of its computer systems. *Page 51*

NEWS

■**Compaq** backs out of the network printer business. *Page 4*

■**General Magic** will get a jump on **Microsoft** with a post-New Year's announcement of a developer's kit and key vendor support. *Page 4*

■**Digital** attempts to make Rdb more user-palatable with promise of ports. *Page 6*

■**Robert McNulty** puts on another hat at **Digital**, taking the job of CIO in addition to data center and outsourcing supervisor. *Page 6*

■**OSF's user members** object to vendor dominance of group's directions. *Page 8*

■Novell tweaks **UnixWare** to improve functionality. *Page 10*

■**HP** plans to **enhance PA-RISC** before moving on to its "post-RISC" architecture. Also, the company's flirtation with **NT** holds little interest for large systems customers. *Page 14*

■**Legent** offers more flexible licensing options to ease upgrades or moves to client/server. *Page 20*

■**RISC-based servers** aren't ready for prime time, but some PC vendors are weighing them vs. **Intel's CISC**. *Page 28*

■The **Cross-Industry Working Team** forms to help establish architectural and technical requirements for the **National Information Infrastructure**. *Page 28*

■**Micro Focus ships** Object-Oriented Cobol in early-release form. *Page 30*

COMPUTER INDUSTRY

■**Loral** bids for **IBM's** federal unit despite the division's problems with the FAA. *Page 32*

DESKTOP COMPUTING

■**Multimedia notebooks** expected to proliferate in 1994. *Page 37*

■**Borland's Obex** makes database query and data import easy. What's hard is getting an answer on the support line. *Page 37*

WORKGROUP COMPUTING

■The **National Weather Service** looks to Unix systems for improved forecasting. *Page 51*

ENTERPRISE NETWORKING

■**Norwest Mortgage** finds net stability with centrally managed FDDI backbone. *Page 57*

LARGE SYSTEMS

■**Sherwin-Williams** invests in **decision support** for district managers. *Page 65*

APPLICATION DEVELOPMENT

■**The OMG** and **Microsoft** discuss possible linking of **CORBA and OLE**. *Page 69*

MANAGEMENT

■**Benchmarking** can be invaluable, *if* you understand your own company's processes before you start looking at others. *Page 73*

■**Good project** managers aren't born that way. You too can learn the skills. *Page 76*

IN DEPTH

■You know you saw it, but you can't remember when? Stop scratching your head. Check the annual **In Depth index**. *Page 81*

CAREERS

■IS staffs want their **managers** to be leaders, not doers, but **technical proficiency** does get respect. *Page 85*

■Don't cower if you see **the shadow of the ax** approaching. Start documenting your value. *Page 86*

MARKETPLACE

■Save yourself some aggravation. Avoid the **common mistakes** in purchasing hardware and software. *Page 93*

COMMENTARY

■**Digital** can't depend on its relationship with Microsoft to solve all its problems, writes **Charles Babcock**. *Page 6*

■1993 may not have been a great year, but it did produce a lot of good acronyms for rhyming. **Paul Gillin** checks it out and finds puns aplenty. *Page 34*

Company Index .... *Page 100*
Editorial/Letters to the editor .... *Page 34*
Friday Stock Ticker .... *Page 101*

Executive Briefing

Common errors in company benchmarking efforts: The first team you pick is frequently the **wrong team**, says Jeffrey Jackson, quality specialist at Alcoa. "They're usually all from the same area." Also, companies often **set their sights too high**, comparing themselves with companies they cannot possibly match. *Page 73*

E-Mail and beyond: The **Federal Government** is awash in **E-mail initiatives**, as various agencies seek the power of mail-enabled applications. Hitches: Government E-mail is now very rudimentary and uncoordinated. Some worry that the result may be an **electronic Tower of Babel**. *Page 1*

Also worried about mail-enabled applications is Columnist John Gantz. Specifically, he's concerned that Notes and other applications promoting information-sharing will foster an **unpredictable and ungovernable demand on network resources**. Even worse, IS managers haven't even started thinking about the issue. *Page 35*

Unix doings: **Novell** is making few friends in the Unix community with its decision to push a **proprietary management system** for UnixWare, shunning work in progress by **COSE**. *Page 1*

At the same time, many large-user members of **the OSF** are dismayed by the **vendor dominance** they see developing, now that the OSF is blending with COSE. "COSE is a virtual organization," said one vexed member. "There's no mailbox, no phone number and no open process." *Page 8*

No more object envy and other OOP developments: Cobol programmers won't have to feel left out of all the excitement for long. The full ANSI standard isn't expected until 1995, but at least one company, **Micro Focus**, is planning to have an object-oriented version of Cobol on the street in the first half of 1994. Actually, two alternatives will be offered: one that provides object-oriented extensions to Cobol and another that lets Cobol developers use Smalltalk. *Page 30*

There are also hopeful signs of general interoperability between the **Object Management Group's CORBA** standard and **Microsoft's OLE**. Behind-the-scenes negotiations are reportedly in progress. Benefit for users: the combination of OLE's desktop strength in integrating desktop applications and CORBA's power to integrate client and server applications on mixed platforms, without an intervening layer of software. *Page 69*

Feeling generous? Lots of food banks across the country are looking for **technical assistance** and donations of **computer equipment**. In some cases, helping an organization choose what equipment to buy would make a major difference. *Page 12*

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	PHONE:	FAX:
Main office, Framingham, Mass.	(508) 879-0700	(508) 875-8931
24-hour tip line	(508) 820-8555	
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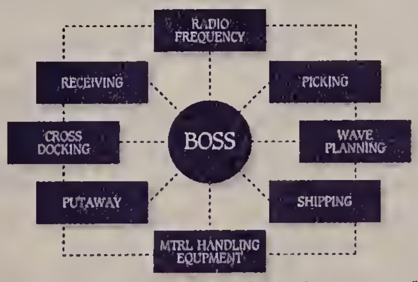

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Compaq exits printer business

By Michael Fitzgerald

After its initial splash in the network printer market, Compaq Computer Corp. has decided if it can't win, it won't swim.

The Houston-based PC maker said last week it would discontinue printer development immediately and stop making its PageMarq printers in the first half of next year, leaving several new products on the drawing board. While it will still sell its printers, it is closing down its peripherals division.

Despite Compaq's exit from the market, analysts said printer prices are not likely to rise, as plenty of competitors are still in the game and can pursue Compaq's share.

Compaq decided after a lengthy evaluation that it did not want to make the "significant investment" necessary to expand its printer business, noted Daryl White, Compaq's chief financial officer. Compaq will shift its research and development money into areas such as the convergence of PCs and consumer electronics, he said.

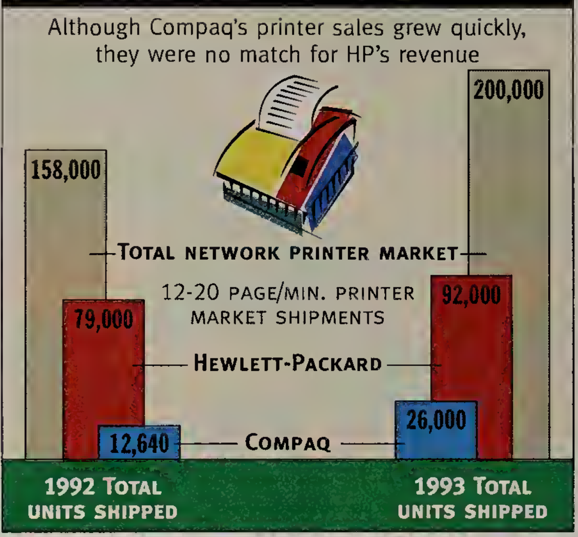
Couldn't compete

Analysts said Compaq has been concerned for some time about the return on its investment in the printer market. White acknowledged that "the crux" of withdrawing from the printer business was the investment required to continue battling in the highly competitive market, which is dominated by Hewlett-Packard Co.

Joel Wecksel, a Gartner Group, Inc. analyst in Stamford, Conn., said Compaq's "failure was its lack of understanding on how long and hard people like HP [work] in this market and its inability to link its printers strategically in people's minds with its computers."

Little impact

Although Compaq's printer sales grew quickly, they were no match for HP's revenue



Source: BIS Strategic Decisions, Norwell, Mass.

Wecksel said even though Compaq had taken some market share from HP, "it was kind of like being in the Kentucky Derby: Nobody remembers who's second."

Analysts also said management upheaval in the printer division hurt it by slowing its plans to expand into low-end markets.

Some users contacted said the lack of a diverse product line had made them decide against Compaq printers. Compaq had only two products targeted solely at the high end of the printer market.

Wayne Robertson, systems administrator at Saint Agnes Medical Center in Fresno, Calif., who typically buys Compaq products, said he decided against PageMarq despite a positive evaluation of the product. Compaq "did not have a middle or low-end machine, and I don't have any problems with HP. So why should we go through a change or internally support more than one brand?" he asked.

Compaq also may have been hurt by technical problems. One user, Nick Ashton-Hart, systems administrator at Patti Roscoe and Associates, Inc., a ground tour operator in San Diego, said the fuser, which fuses toner to the paper, in the company's PageMarq 20 had blown out after every 18,000 sheets. Eventually, his reseller replaced it with an HP printer. While Compaq did issue a service advisory in August regarding fusers, other users contacted reported no such problems.

White said despite the closing of the peripherals division, Compaq will keep developing other peripherals, which he declined to name. The division's employees will likely be transferred to other Compaq operations, he said.

IBM eyes plan to boost VAN market presence

By Michael Fitzgerald
and Lynda Radosevich

IBM is developing a messaging-oriented value-added network designed to provide access to information across a multitude of networks, sources said last week. The network is expected to be announced in January or February.

The service, until recently code-named In-Touch, will allow users to easily send and retrieve messages, documents, faxes and voice mail over both corporate and external value-added services via wired and wireless networks.

Revenue booster?

IBM hopes the messaging service will help boost nonhardware-related revenue, which has become the company's mantra.

The system provides "electronic document management that includes voice and E-mail over wireless services" and will be built so it can run on personal digital assistants, according to a source close to IBM.

IBM last summer demonstrated a prototype interface using icons such as a phone and a notepad that users would click on to get information. IBM created a division to develop In-Touch in June, sources said. The service is expected to be up and running by mid-1994. IBM is changing the In-Touch name because another company owns it, one source said.

Initial targets will be large companies with mobile workers. IBM is still developing its strategy, but sources said it is looking at using its Advantis and Ardis backbones and hopes to leverage partnerships with the regional Bell operating companies and others.

IBM will compete with AT&T's EasyLink messaging service, sources said, and it hopes to beat archrival Microsoft Corp.'s MicroServe to market.

General Magic seeks to upstage WinPad

By Michael Fitzgerald

General Magic, Inc. will try to gain an edge on Microsoft Corp. in the just-hatched market for personal digital assistants (PDA) on Jan. 6, with the announcement of a software developer's kit for its Magic Cap operating system and support from several major vendors.

General Magic will also announce at the Consumer Electronics Show in Las Vegas that AT&T will use its Telescript communications protocol to build an extension to its EasyLink messaging service, called PersonalLink, according to sources.

General Magic backers and potential PDA makers Sony Corp. and Motorola, Inc. will also be present at the announcement. However, neither company is expected to have its General Magic-based hardware available until the spring, the sources said.

Sony will, however, demonstrate software for the Magic Cap environment at the show.

The release of the software developer's kit will put General Magic a step ahead of Microsoft, which has not released a software developer's kit for its At Work for Handhelds OS, code-named WinPad. But Microsoft has put a beta-code software developer's kit in developers' hands and has held a developers conference for WinPad. Despite rumors to the contrary, Microsoft appears to be on target to deliver WinPad in late spring.

At stake for General Magic is the chance to lead the PDA market in the wake of Apple Computer, Inc.'s stumbling efforts with Newton. The company also hopes to circumvent Microsoft in a potentially fast-growing market.

WinPad support

Still, the Microsoft WinPad effort looks to have significant support from hardware manufacturers. WinPad is part of the Mobile Companion effort that also involves Compaq Computer Corp., Intel Corp. and VLSI Technologies, Inc. The four companies have said they will collaborate on a sub-2-pound, wireless, keyboard-enabled PDA meant to serve as a model for a new PC market.

Compaq would not confirm that it will have a 90- to 120-day window on other hardware makers, nor would it confirm that its hardware will ship simultaneously with WinPad's announcement.

At its Professional Developers Conference last week, Microsoft demonstrated a version of WinPad running on a Compaq Concerto notebook. It ran applications written in Visual Basic and exchanged address information with an application on a desktop PC.

Sources said NCR Corp. is also working on a Mobile Companion-like product, due out in early 1995, that supports a keyboard. Motorola is developing a version of its current handheld that accepts only pen input.

Analysts said they expect the PDA market to develop slowly. Activity will increase throughout the year, however, after WinPad and other products from companies such as IBM PC Co. are announced. Continued efforts by Apple, Sharp Corp. and Tandy Corp./Casio, Inc. may also buoy interest.

"If I were a user, I think I'd wait for a selection to come," remarked Jeffrey Henning, analyst at BIS Strategic Decisions in Norwell, Mass.

On the air

Apple is expected to announce on Jan. 5 a new on-line service aimed at consumers. The service could boost sales of its Newton PDA and may also help Apple expand its revenue stream.

Corrections

Due to an editing error, an item in the Dec. 13 issue should have said that ITT — not its ITT Hartford Life Cos. unit — eliminated its corporate information systems staff.

A story in the Dec. 6 issue incorrectly stated SmartSuite's share of Lotus Development Corp.'s total revenue. SmartSuite accounted for 34% of Lotus' desktop application sales.

Due to incorrect information supplied to *Computerworld*, a Computer Industry story in the Nov. 22 issue stated that no object-oriented database management system maker pulled in more than $10 million in sales in 1992. However, Object Design, Inc. recorded $11 million in sales last year.

Gentlemen, start your snails.

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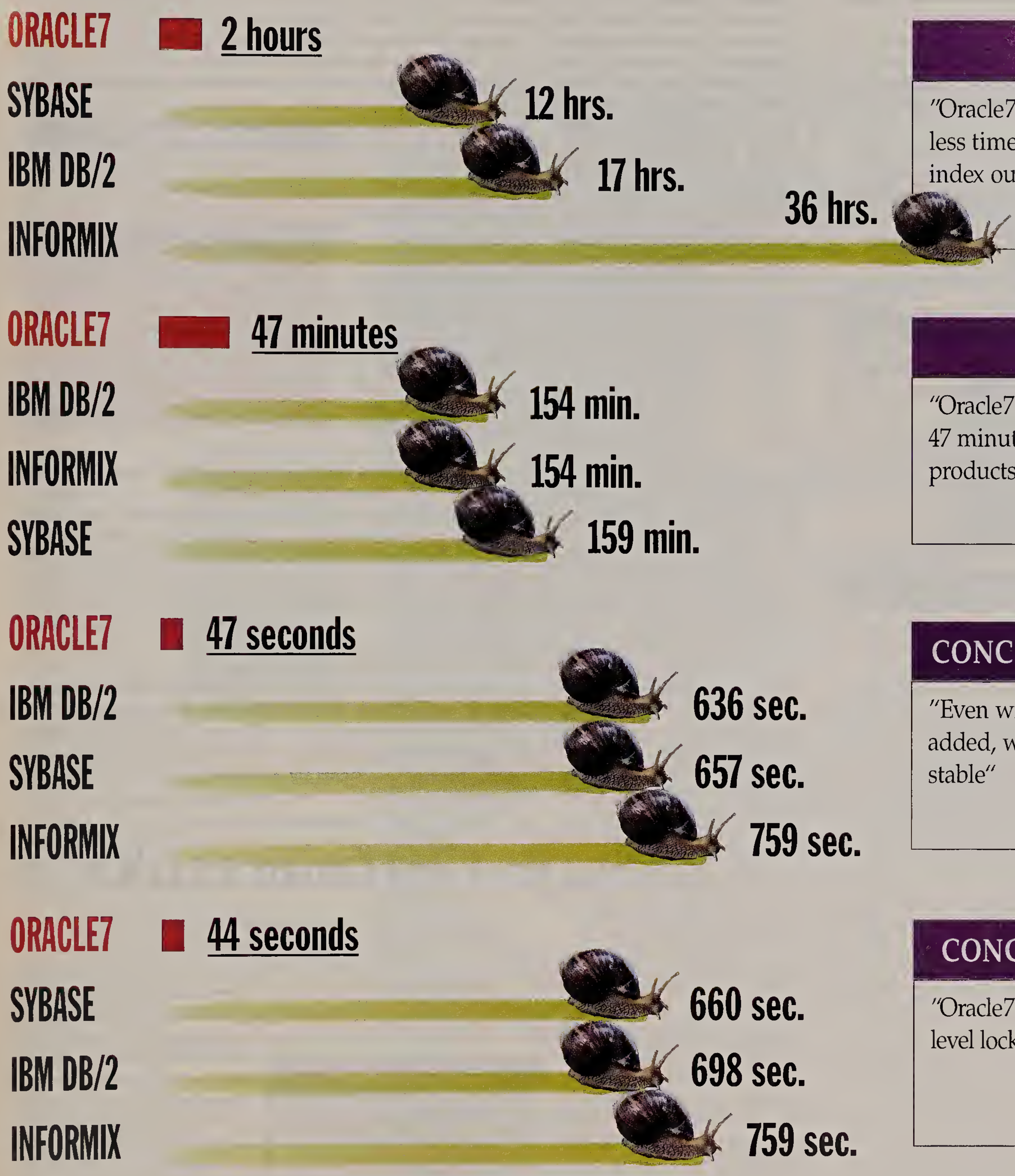

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ORACLE

Digital hitched to Microsoft star

With its traditional scientific/engineering customers emigrating to Unix workstations, Digital Equipment Corp. had to decide whether it should remain a proprietary vendor, become a Unix/open systems vendor or pursue a greater share of desktop sales.

In effect, it decided to do all three, although it seemed to stake its greatest hopes on running Microsoft's Windows NT as a desktop system on its new Alpha microprocessors. And therein lies the tale of Digital's current strength and weakness.

Digital is still following its instinct to be a systems integrator from the top to the bottom of organizations, even though that's a role that most integrators have found progressively more burdensome. Digital's trump card is the Alpha computer architecture, which was designed to be operating-system independent and hence play across all levels. But having spent $1 billion to bring the Alpha fabrication line into volume production, Digital now needs to line up Alpha customers.

The Meta View

Digital must build a strong new identity that is independent of its relationship with Microsoft.

Charles Babcock

Digital is pinning its hopes of achieving volume on selling end-user Alpha systems running Windows NT. So the Digital/Microsoft relationship, which previously consisted of sharing networking and PC integration technology, has shifted onto a higher plane of need and risk.

Technology exchange between the two has been replaced by an invisible umbilical cord, with continued life support dependent on NT success. Digital has never before been so dependent on the fortunes of an outside company.

Microsoft is not an unwilling partner in this relationship. I remember seeing Bill Gates speak at DECWorld '92 in Boston. Ken Olsen gave him a gracious introduction, and Gates offered what appeared to be a heartfelt summary of his early days as a programmer and where he thought the two companies were headed.

At the time of the Microsoft/IBM rift, Gates turned to Digital, I think, as a partner whose experience could help offset IBM's might. Digital also represented a reservoir of large system, peer-to-peer networking expertise that Microsoft needed.

To Jesse Lipcon, vice president of systems marketing at Digital, Microsoft needs Digital as much as ever. For one thing, Digital is the largest OEM of Microsoft's LAN Manager (it packages it into Pathworks). "Microsoft is trying to move upscale into the enterprise. That's what Digital brings to the game," Lipcon asserted at a plenary session at the recent Digital Equipment Computer Users Society conference in San Francisco.

But Digital's friends look at the tie that binds and worry. Windows NT is off to a slow start, and Digital is seeing Alpha tapped to function in a few NT servers. It would prefer to see NT running on hundreds of thousands of desktops powered by Alpha chips.

Microsoft has been forced to bow to reality by repositioning NT as a server system. I believe Digital is protesting this stance behind the scenes in hopes of spurring Microsoft to generate more NT end-user sales. In this instance, Digital should accept reality and not expect the impossible from an ally.

But where does that leave Alpha?

Digital needs to build confidence that it has reorganized its non-Alpha business into an ongoing, profitable enterprise to buy time for the Alpha architecture to assert itself. But it still hasn't formulated a convincing argument that its systems integration effort is a unique strength and can be both marketable and profitable.

Its last quarterly loss was small, but any red ink is a flag of caution to customers considering converting to a new computer architecture. Digital's dilemma is that it must forge a new identity before it can reap the benefit of its new technology, and it still seems tentative in going about this task.

Babcock is *Computerworld*'s technical editor. His MCI Mail address is 575-2737.

Relational databases

Digital to port Rdb . . .

By Craig Stedman

Digital Equipment Corp. plans in February to try to allay user concerns about the future of its Rdb relational database by pledging to port the software to other hardware platforms. However, sources said the move would likely be limited and dependent on up-front customer demand.

Digital "wants to cost-justify everything they do, and it would be hard to do that with a plan that says you're going to just port to multiple platforms," said Lynn Berg, an analyst at Gartner Group, Inc. in Stamford, Conn. "Digital is not set up to be a generic database vendor."

"We don't plan to run on every platform or every box out there in the world," agreed Nelson Hsu, client/server and database marketing manager at Digital. "It's a matter of where the demand is going to be called for by our customer base."

Hsu confirmed that "a statement of strategy and direction" on non-Digital versions of Rdb will be part of the February announcement, which is also expected to include the formal introduction of Rdb for the DEC OSF/1 operating system — the first non-OpenVMS release of the database.

Rdb for DEC OSF/1 is due to ship in the first half of 1994 and a release for Microsoft Corp.'s Windows NT is planned for later in the year. Extending the NT version beyond Digital's Alpha AXP systems to support Intel Corp.'s Pentium chip and Silicon Graphics, Inc.'s Mips architecture would be "an easy transfer," Hsu said, although he did not commit to doing that.

Stumbling block

The portability issue has been a key stumbling block for some users who evaluated Rdb. The Chicago Stock Exchange started moving from Oracle Corp.'s database to Rdb in 1992 but put the project on hold earlier this year after deciding the conversion costs would be too high, especially given the likelihood that it will shift away from pure reliance on Digital hardware.

"We may not end up a year from now having Digital as the primary supplier of our computers, so the safe bet is to remain with a [database] that gives us flexibility," said Jason Leyva, director of systems engineering at the stock exchange. He said the decision to stay with Oracle could be reopened if Digital does support Rdb on other platforms.

Bob Cloninger, data processing manager at OK Industries, Inc. in Fort Smith, Ark., said he chose Borland International, Inc.'s Interbase database over Rdb several years ago to avoid "getting locked into VMS or another proprietary operating system. I want to be able to go wherever I need to go."

Analysts were split over Digital's strategy. Rdb has performance advantages for large production systems, said Judith Hurwitz, president of Hurwitz Consulting Group, Inc. in Watertown, Mass.

But Irv Shapiro, president of Metamor Technologies Ltd. in Chicago, said Rdb has become "a very hard sell" and limited portability would not be enough to change that.

More on the table

The February announcement is also expected to include DEC OSF/1 versions of Digital's DB Integrator and DBA Workcenter products, plus an updated release of the company's ACMS transaction-processing software that could be integrated with databases other than Rdb, sources said.

. . . and taps CIO from ranks

By Craig Stedman

Digital Equipment Corp. last week gave Robert McNulty, who heads its outsourcing and internal data center operations, the additional job of chief information officer. As CIO, McNulty takes charge of Digital's corporate application development.

The move to combine all information systems under McNulty is a change from the company's original plan to have a separate CIO handling application development. Digital had trouble enticing outside prospects to take the CIO job after control of its data centers was shifted to the outsourcing unit [CW, Sept. 27].

Executives indicated in September that the CIO position had been offered to a Digital employee in Europe. However, McNulty said the company eventually decided "that we didn't need a separate CIO because our customers' needs are the same as our internal needs." The outsourcing unit is "treating Digital as our largest customer," he added.

Mike Melenovsky, an analyst at International Data Corp. in Framingham, Mass., said Digital's change in plans makes sense. "Program development has to be an integral part of the day-to-day running of IS," he said.

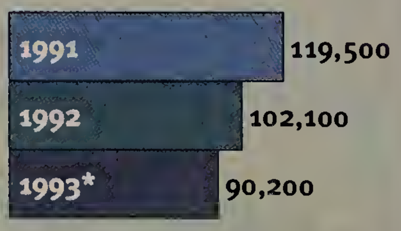
However, a consultant close to Digital noted it may be tricky to balance internal and external demands. "It becomes an issue of whether you serve the inside or outside master," he said. "Profits are driven by the outside world, so inside users can get ignored."

McNulty reports to a board of six Digital executives, which differs from the original plan to put the job solely under Chief Financial Officer William Steul.

Digital downsizing

Digital last week began a new round of layoffs in product marketing and the customer business units set up earlier in the year, company officials confirmed. Sources estimated 3,000 workers could be laid off.

TOTAL WORK FORCE (END OF CALENDAR YEAR)



*Estimate

Source: Digital Equipment Corp., industry sources

Racal to ship first PCI LAN adapter

By Stephen P. Klett Jr.

While not in time for the Christmas rush, Racal InterLan, Inc. announced it will ship in March the first Peripheral Component Interconnect (PCI) LAN adapter card. The company said the board will result in data transmission rates that are up to four times faster than those possible with Extended Industry Standard Architecture (EISA)-based systems.

Bus breakdown

Racal InterLan's PCI adapter card promises significantly higher performance at an aggressive price

Bus	Bandwidth	Price*
XT/AT	8M byte/sec.	$125
EISA	32M byte/sec.	$300
PCI	132M byte/sec.	$250

*Approximate

Spurred by widespread acceptance of Windows and OS/2, PCI is a 32-bit, local-bus standard designed to eliminate the performance bottlenecks associated with running graphic-intensive applications, which bog down older bus architectures, such as XT/AT and EISA, and degrade network performance.

Making changes

Pacific Gas & Electric Co. in San Francisco, which buys approximately 2,000 PCs a year, said it expects to move totally away from XT/AT and EISA within two years in favor of VL or PCI.

Racal InterLan said the Ethernet adapter card will have a PCI interface and will be based on Advanced Micro Devices, Inc.'s PCnet chip set. The card will work with any PCI-compliant PC or server and will carry a price tag of roughly $250, according to Robert Pulley, engineering director at Racal InterLan in Boxboro, Mass.

With many vendors, including Compaq Computer Corp., Hewlett-Packard Co., IBM, Dell Computer Corp., Apple Computer, Inc. and Digital Equipment Corp., set to announce PCI-based systems in the first quarter, analysts said the appearance of supporting products is vital.

"Users need to know products such as adapter cards will be there when PCI becomes widely available or it won't take off," said Tracey Corbo, an analyst at International Data Corp. in Framingham, Mass. "This announcement is another sign the industry is starting to catch up with CPU technology by offering faster and wider paths" networkwide, she said.

While initial interest in PCI will be for high-end multimedia and video applications, proponents said they expect PCI to move into the low end as prices drop and users' understanding of its capabilities increases.

"Our goal with PCI was to create a bus that handles more than just graphics. It offers LAN advantages as well," said Mike Bailey, chairman of the PCI Special Interest Group, which owns and manages the PCI local-bus specification. For example, with adapter cards such as Racal InterLan's, users will be able "to simply plug in their existing LANs and be up and running with PCI," he said. PCI's higher bandwidth will also support emerging high-speed LAN technology such as 100M bit/sec. Ethernet, he added.

Because of its automatic configuration capability and processor independence, PCI is seen by some observers as a better alternative than the 32-bit VL-bus introduced by the Video Electronics Standards Association last year. However, users said PCI's prices would have to be in line with VL-based — and XT/AT and EISA-based — systems for them to move to the platform (see chart).

"PCI is a safer way to go because it has a controller between the CPU and bus, but cost is still the most important issue for us," said Abe Chait, project manager at Pacific Gas & Electric Co. in San Francisco. "However, PCI is heads above [VL], so if the price delta is close, we will go with PCI."

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Unix

IS fears losing open systems influence

By Jean S. Bozman

Some of the world's largest Unix users, concerned about the restructuring of the Open Software Foundation (OSF) and the vendor orientation of the Common Open Software Environment (COSE), are looking for a new platform from which to help steer the evolution of open systems.

Even as members of the OSF board met last week without any luck in deciding the organization's new structure, members of the OSF's end-user steering committee held an electronic meeting to ensure their continued participation in the creation of open systems standards.

Users worry that without their input, open systems efforts will be driven largely by vendors that are more interested in proprietary systems than open standards. This is particularly important as the OSF restructures, blending many of its development resources with those of the COSE coalition.

"The people who are putting these changes together are the small club of the systems-vendor sponsors of OSF," said Ted Hanss, chairman of the OSF end-user steering committee, "and they have not invited any end user or [independent software vendor] to review the proposed changes."

For the past four weeks, the end-user committee has fired off letters to IBM and Hewlett-Packard Co. but has not received any responses, Hanss said. Of the OSF's 400 members, about 100 are vendors, more than 60 are independent software vendors and more than 200 are user sites, he noted.

HP and IBM did not comment by press time.

The boundaries of the debate transcend the OSF and include other standards and Unix industry groups, Hanss said. "Our next step is to actually draft some kind of public statement to raise the visibility of the fact that end users want a strategic-level input into the open systems processes," he said. "The general principles apply not only to OSF but also to X/Open and [the Object Management Group] and COSE."

Steering committee members hinted last week that they plan in January to disclose a new form of user feedback for the Unix vendors. But they gave no details, other than to say that OSF board member Mike Johnson, former head of information technology at Unilever PLC in London, would be involved.

OSF Chief Executive Officer David Tory last week acknowledged users' frustrations. "The critical issue is that users want to make sure they can continue to participate in X/Open and in OSF at the same level, at an equal level, as before," Tory said. He did not comment directly on COSE, however.

COSE closed

But users on the 21-person steering committee are worried that they have no forum to voice complaints through COSE, which is fast overtaking the OSF as a development mechanism for the world's top Unix vendors. Some users are concerned that IBM, HP and Sun Microsystems, Inc., which is not an OSF member, prefer to work quickly in the COSE group, without being slowed by user feedback.

"COSE is a virtual organization," said Tony Carrato, a founder and consultant at Mile-High Information Services, Inc. in Denver who serves on the OSF end-user steering committee. "There's no mailbox, no phone number and no open process."

Even users outside the OSF steering committee are concerned about user input to Unix vendors — other than direct feedback. "I'm mad that some of the big vendors who have the big sign on the window that says 'open' really have no intention to be open and are working on all kinds of ways to stay proprietary," said Bill Connor, corporate vice president and information technology director at Motorola, Inc.'s General Systems Division in Arlington Heights, Ill.

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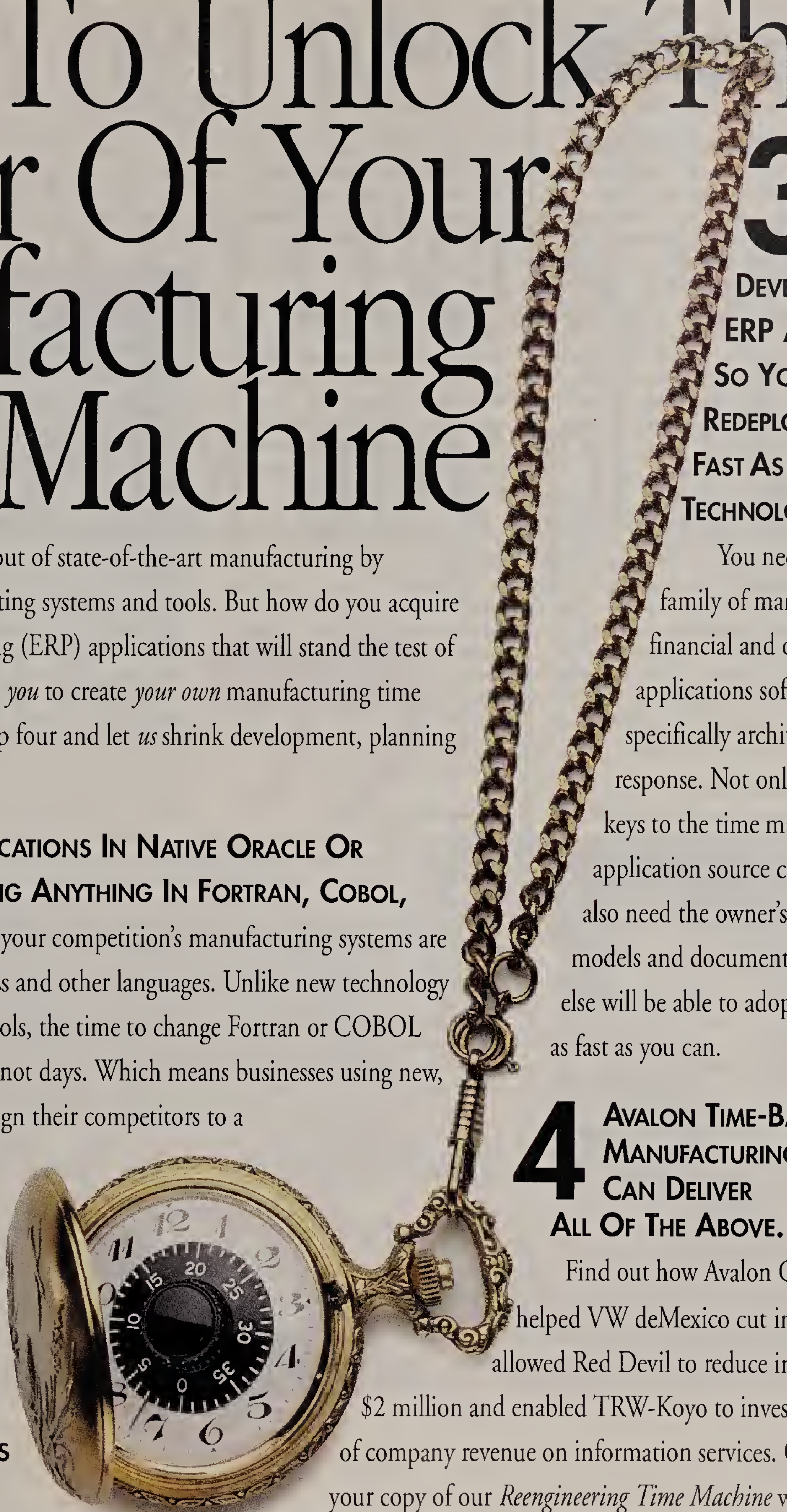

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News Shorts

IBM to split Personal Systems division

IBM plans to reorganize its Personal Systems Division, according to an internal memo sent to IBM employees last week, sources said. IBM's Advanced Workstation Division (RS/6000) and the Personal Software Products units will be shifted to its Large Systems Division, reporting to John Thompson. The **IBM PC Co.** and the Power Personal Systems group will report to the James A. Cannavino's replacement, who sources said was expected to be named this week. Cannavino was recently named IBM's senior technology officer. The move was made to bring IBM's non-PC systems groups together and give the company greater focus, an internal source said.

Kendall ousts founder

Henry Burkhardt III, founder and president of **Kendall Square Research Corp.**, has resigned from the troubled parallel processing vendor. Burkhardt left the Waltham, Mass., company two weeks after being stripped of his chief executive officer title following allegations that the firm had recorded inflated sales figures. Those allegations led to a Securities and Exchange Commission investigation and a shareholder suit. Kendall said it plans to reorganize to increase its emphasis on the commercial market and establish an independent audit and finance department.

3Com to acquire Synernetics

3Com Corp. last week agreed to purchase Ethernet switching vendor **Synernetics, Inc.** in North Billerica, Mass., for $104 million. Synernetics projects its 1993 revenue will be $27 million, 45% of which is from sales to 3Com. The deal, expected to be completed in January, makes 3Com the leader in the market in terms of revenue, according to projections by Dataquest, Inc., which estimates the 1993 Ethernet switching market at $60 million. Synernetics will remain in Massachusetts as 3Com's Ethernet switching division.

Multimedia patent reevaluated

The **U.S. Patent and Trademark Office** announced last week that is will reexamine the controversial multimedia patent awarded to **Compton's NewMedia, Inc.** [CW, Nov. 22], according to the *San Francisco Chronicle*. The office ordered the reexamination after receiving newly released information on what is know as "prior art" — technology widely used prior to Compton's being granted the patent. Compton's claims its patent covers the basic technology used by virtually every multimedia program sold today.

Tivoli opens object management frame

Tivoli Systems, Inc. last week announced an open licensing program for Tivoli Management Framework 2.0, a set of specifications for object-oriented systems management tools. Software vendors would build application programming interfaces to the framework for performance monitoring, backup, recovery and other utilities for Unix environments. The goal is to get tools from different vendors to work together using common Tivoli blueprints.

SHORT TAKES **Cabletron Systems, Inc.** has become the 12th member of the Fast Ethernet Alliance, a group of networking companies creating specifications for 100M bit/sec. Ethernet technology. . . . Client/server applications maker **PeopleSoft, Inc.** signed up **Andersen Consulting** to resell PeopleSoft packages to various government and public-sector users. . . . **The ASK Group, Inc.** said it has begun shipping development and connectivity tools for Microsoft Corp.'s Windows NT.

More news shorts, *page 16*

Novell

CONTINUED FROM PAGE 1

Novell also has apparently backed off from active support of the Common Open Software Environment (COSE) consortium's plans to develop common Unix systems management specifications.

While Novell remains a group member and supports the COSE desktop environment, the systems management effort is "very informal and fluid right now," said Novell Chief Technology Officer Kanwal Rekhi. "If COSE comes up with systems management specifications, we will look at them."

But the COSE systems management group has a concrete objective of coming up with a common set of standards, many of them existing, that the leading Unix vendor members can agree to implement, said Larry Robinson, a Hewlett-Packard Co. spokesmen and COSE group member. The initial goal is to have a core set of Unix desktop management facilities sometime next year.

Talking to Tivoli

Novell is "actively discussing" integration of NDMS with Tivoli Systems, Inc.'s Unix systems management platform, which is the basis of Distributed Manager, Tivoli President Frank Moss said.

Rekhi would not confirm or deny the talks. Such a move would potentially allow NDMS to interoperate with the growing number of Unix systems management platforms and applications that comply with the Object Management Group's Common Object Request Broker Architecture.

"Once again, Novell is not paying attention to trends in industry and is implying that NetWare is the foundation of the computing world," said Brian Anderson, chief information officer at Transocean Ltd., a San Bruno, Calif., container transport company. "I need to manage Unix, not just their Unix and Novell, but other network operating systems as well."

Tighter links

Upcoming developments to bring UnixWare and NetWare together include the following:

- NDMS services to manage UnixWare servers and clients (no time frame)
- Access for UnixWare clients to NetWare v3.11 and NetWare 4.01 servers (now)
- UnixWare systems interaction with NetWare Directory Services (mid-1994)
- NDMS may run on Unix (no time frame)

Transocean's Unisys U6000 servers run an OEM version of Novell's Unix System V Release 4.

The idea of using NDMS to manage Unix sounds good to staunch Novell shops that buy into Novell's concept of UnixWare application servers working in tandem with NetWare's file and print services.

"I look forward in the long run for UnixWare and NetWare to become more integrated with one another and to having NDMS manage UnixWare," said Charles Tilbury, a network analyst at the University of Texas' M. D. Anderson Cancer Center. "For us, it makes sense to manage the two together; we're a big Novell shop."

However, a number of companies with a broad mix of NetWare and Unix servers are turning to Simple Network Management Protocol-based enterprise platforms such as HP's OpenView and IBM's NetView/6000. While HP and IBM are aggressively extending their platforms' reach into a variety of systems, Novell's platform — even with NDMS — will only manage UnixWare. NDMS currently has no shipment date.

Reliance on another

Lourdes Hospital, for example, is counting on Cabletron Systems, Inc.'s OEM version of HP's OpenView to provide the "openness and flexibility we need" to manage a mixture of NetWare, IBM's AIX and probably UnixWare in the near future, said Tom Witteman, PC support specialist at the Binghamton, N.Y., institution.

For Unisys, Novell's withdrawal of Distributed Manager means "a total reevaluation of our enterprise management strategy," which had been based on the platform, said Bob Sprowls, Unisys' director of Unix product marketing.

Novell is offering Distributed Manager developers the option of migrating their applications to Tivoli's management framework. Unisys is considering this option, as well as platforms such as OpenView, Sprowls said.

NMS' "NetWare-centricity" makes it unsuitable as Unisys' enterprise systems management platform, he indicated.

UnixWare gets NetWare 4.01 links

Global directory service still to come; other updates unveiled

By Elisabeth Horwitt

Novell, Inc. last week provided a few small but important functional improvements to UnixWare, its version of Unix System V Release 4 with embedded NetWare support.

Client systems running UnixWare 1.1 will be able to access NetWare 4.01 servers for the first time, Novell said. However, UnixWare systems will not be able to tap into NetWare 4.01 NetWare Directory Services (NDS) until the introduction of UnixWare Version 2.0, slated for delivery in mid-1994, a company source said.

Novell is still weighing whether to implement the global directory service directly on UnixWare or provide NDS on NetWare with hooks to a variety of Unix systems, the source said. The latter implementation would allow a broader range of Unix products to transparently access resources on NetWare servers and also make their resources available to NetWare clients.

UnixWare 1.1 also includes Advanced Merge for Windows, a feature enabling Windows applications running UnixWare to access NetWare services. Version 1.1 is said to resolve the performance problems inherent in the earlier version, the source said.

Further enhancements

Other enhancements in UnixWare 1.1 include the following:

- •Compliance with OSF/Motif 1.2 runtime libraries, which provides UnixWare systems with a look and feel that conforms more closely to the Common Open Software Environment's Common Desktop Environment, Novell said.
- •Support for TCP/IP bundled into UnixWare Personal Edition, with support for Point-to-Point Protocol and Serial Line Internet Protocol remote networking protocols.
- •Support that will enable network administrators to bring up both NetWare and UnixWare system activity on a single Simple Network Management Protocol management console.
- •Support for a broader range of CD-ROMs, SCSI adapters and network adapter cards, as well as for IBM Token Ring source routing.

UnixWare 1.1 will be available through Novell Gold, Platinum and Unix Master Resellers, free of charge to UnixWare 1.0 customers and those who register prior to July 1994.

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Food banks

CONTINUED FROM PAGE 1

calls," she said.

Before computers arrived in offices, hot line workers had to rustle through mounds of paper and notebooks to find information on which shelters and soup kitchens had space for clients. But the data was often outdated, and the computerized method is just "infinitely better," O'Connell said. "Especially during the holidays, things got lost or overbooked or underbooked. We can do a lot more now."

Some 190 major food banks — and countless other smaller ones — act as regional food pantries, serving every county in the nation. They distribute food donated by manufacturers, farmers, restaurants, hotels and other sources to 150,000 soup kitchens, shelters, day-care centers and other client agencies, which in turn cook and serve the food.

Technology gives volunteers *such as Andrew Gladyszak at Rosie's Place more time to help*

STELLA JOHNSON

Of the major food banks, about one-fifth still operate without any computers, likely "because of a lack of funding," said John Muller, data processing manager at Second Harvest in Chicago. Second Harvest is a national nonprofit organization that puts food banks in touch with sources of food close to them and acts as an information clearinghouse.

The rest of the country's major food banks and hunger agencies are computerized to differing degrees: The Los Angeles Regional Food Bank has an RS/6000 and seven stand-alone Macintoshes, and New York's City Harvest has 20 networked IBM-compatible computers. North Carolina Harvest in Charlotte is looking to buy its first computer. About one-third of agencies that are computerized have some kind of LAN, Muller said, typically with three to five workstations attached.

Only the largest food banks have an in-house systems administrator. Most make do with part-time technical help that is donated or paid for with scarce funds. Staffers at Project Bread get in touch with a paid part-time computer consultant — known only as "Kwok" — by leaving yellow notes around his PC.

Computers are even reaching down to the most grassroots level — the individual shelter and soup kitchen. The Olive Branch Mission in Chicago uses a Compaq Computer Corp. server with six networked 486-based PCs for word processing and accounting and to track information.

The Failure to Thrive Clinic at Boston City Hospital provides medical resources as well as social and nutritional counseling to undernourished inner-city children and their families. The 18 staff members — mostly part-time — have four 80286-based computers to share among them.

Lisa Harmer, administrator of one of the clinic's departments, said that when she started working there a year ago, there were no computers at all. "I'm an MBA, and I had never seen ledger paper until then, except in *A Christmas Carol*. So I bought a 486 for my home, and I did our budgets, grant applications and personnel records on it." Then the donations started rolling in, including a new PS/2 Model 25 a few weeks ago.

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Indeed, much of the computer gear is donated and therefore old and outdated — unable to run even medium-size databases without crashing.

"This is a complicated organization, and I need more than a pat on the head telling me to go out and get a Mac," said Doris Bloch, executive director of the Los Angeles Regional Food Bank, the nation's largest, which will ship about 36 million pounds of food this year. "Nothing against the Mac, but there's no way to track this amount of inventory on it."

Hunger today

More than 12 million American children experienced hunger in 1991.

Source: Center on Hunger, Poverty and Nutrition Policy, Tufts University

More than 20 million Americans suffer from hunger.

Source: Former Select Committee on Hunger, U.S. House of Representatives

On average, 21% of the requests for emergency food assistance in U.S. cities went unmet in 1992. In two-thirds of these cities, emergency food assistance facilities were forced to turn people away because of a lack of resources.

Source: U.S. Conference of Mayors, Task Force on Hunger and Homelessness, 1992

Many of the computer-related issues that nonprofits face are things corporate information systems managers can readily understand. Second Harvest, which uses a Unix machine running an Informix Corp. database with 30 IBM-compatible PCs hard-wired to the Unix box, is trying to put together an electronic-mail network for food banks to share information electronically.

"To do that we have to reconcile DOS, Windows and Macintosh" computers, Muller said. "Synchronizing a variety of automation is probably my greatest challenge. We want to allow the food banks to pass information back and forth."

For many of these organizations, computers are no longer a luxury.

"A computer allows small staffs to do a lot of important things rather than keeping records, like drumming up more food donors," said Lindsey Ford, grants director at Share Our Strength, a Washington fund-raising organization for hunger groups.

Bloch agreed. "A nonprofit has to run every bit as businesslike as a private-sector company. And to do that, you need darn good data."

Midwest bureau chief Ellis Booker contributed to this story.

Wishing on a star

A technology wish list from the nation's food pantries:

- **Most of all, the regional food banks need some technical expertise.** "Whether it is in networking, or how to streamline their operations, or helping them figure out what kinds of technology they need before they go out and buy it, there's a great demand for assistance," said Lindsey Ford, grants director at Share Our Strength.
- **Newer, bigger computers.** The Chicago Christian Industrial League would like more PCs to help homeless people get jobs by teaching them computer skills.
- **Printers, particularly laser printers.** Most food banks are sharing one or two printers among staffs that can total as many as 100 (including volunteers). Plus, laser printers help defray the costs of sending leaflets and such to typesetting shops.
- **Networks.** Project Bread in Boston, for example, has 25 stand-alone PCs that would help the organization more if they were linked. "The information is splintered because each group within Project Bread maintains its own database," said Joel Forman, business manager. "It would be much more efficient for everyone to be able to access the same files."

If you would like to donate time or equipment to food pantries in your area, contact your local United Way. Or call Share Our Strength in Washington at (202) 393-2925 or Second Harvest in Chicago at (312) 263-2303.

Big assist

In addition to using databases to track donors and agencies with which they do business, food banks use computers for many other tasks. The following are some examples:

▶ **Fundraising.** This is a major reason nonprofit organizations become interested in technology. With desktop publishing, food banks can crank out their own brochures, solicitation letters and thank-you notes. John Mooney, director of public relations at New York's City Harvest, said a scanner-equipped system would help his group save $3,000 in printing costs each year.

▶ **Record-keeping.** Because food banks deal with perishable items, state health departments require strict records of how old the food was when it was picked up, at what temperature it was stored and for what duration, before the food is given to the recipient agency. Food banks also use the computers to track how much food they pick up and distribute.

▶ **Tracking volunteers.** All nonprofit organizations rely on free help, and many use computers to track the kinds of skills and time volunteers contribute. For example, a group needing a designer could search its volunteer database for once.

▶ **Back-office functions.** These include keeping track of staffers' hours; word processing used for writing proposals to the government and other funding agencies; and budgeting.

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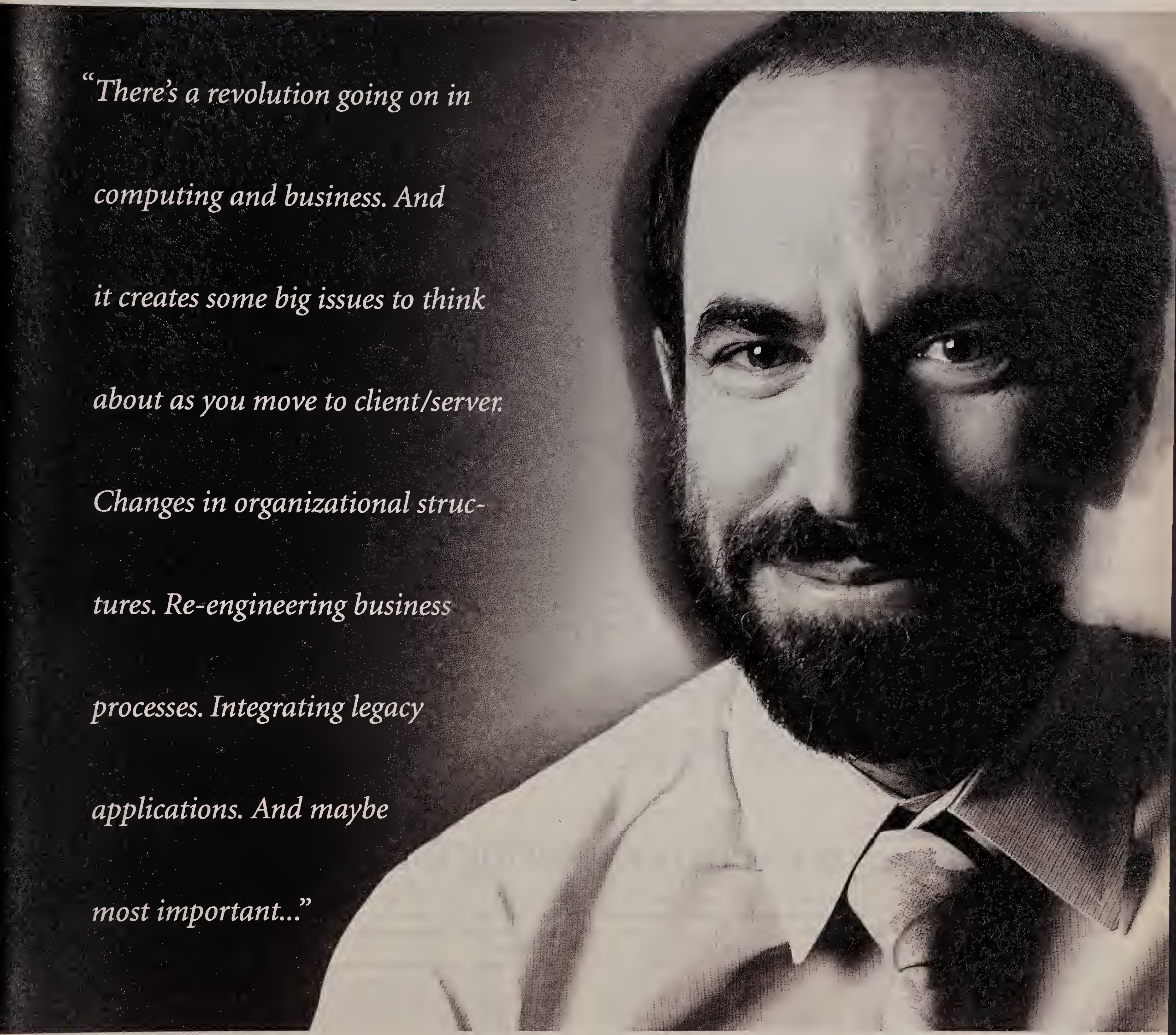

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HP lays out next-generation chip plans

Current offering receives power boost

HP's PROCESSOR ROAD MAP

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MID-1995:

PA-8000
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1997-1998:

PA-9000
- "Post-RISC" using VLIW technology

By Mark Halper

Before Hewlett-Packard Co. moves to its "post-RISC" architecture, it has a few enhancements in store for its current PA-RISC, including a 125-MHz chip announced last week and a 64-bit, 200-MHz design due in mid-1995, the company said.

HP also provided details for the first time of its previously undisclosed plans for adding Windows NT support to PA-RISC and eventually moving to a new architecture [CW, Dec. 6, 13].

Users such as Dave Brolsma, manager of information systems at Chrysler Corp. subsidiary Acustar Electrical in El Paso, Texas, noted that while it is always encouraging to hear about faster chips, his near-term upgrade plans are for the desktop, not the enterprise server.

"The thing to remember is that as you move to client/server, you're pushing processing and costs to the desktop, so you have to save somewhere," Brolsma noted. "I'm not sure I'll need more powerful servers in the background."

Ron Gillet, vice president of IS at Houston-based energy company The Coastal Corp., noted that he does not have an urgent need for more processor power; his interest in future processors will be based on pricing. "The bottom line is none of that directly impacts me unless it lowers my costs," Gillet said.

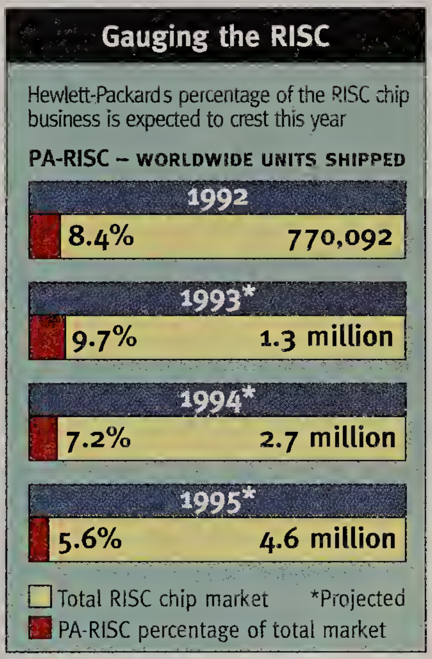
Jan Silverman, HP marketing manager for advanced technologies, last week said HP's move to a post-RISC processor, which will rely in part on Very Long Instruction Word (VLIW) technology, will come in 1997 or 1998. That move, which augurs chip performance of billions of instructions per second compared with today's millions, has raised concern among users over compatibility with existing PA-RISC software.

Silverman last week reiterated earlier HP statements that the company will ensure the new architecture is compatible with the old.

But one of the most immediate PA-RISC changes is scheduled for next month when, Silverman said, HP will add a bi-endian version of PA-RISC and announce workstations (see story page 15) and minicomputers that use that chip, which will be called the PA-7100LC. HP said it also plans "a new class of LAN servers" built on the 7100LC.

Gauging the RISC

Hewlett-Packards percentage of the RISC chip business is expected to crest this year



Source: Dataquest, Inc., San Jose, Calif.

Systems using the chip will ship in the first half of the year, and HP said the chip itself is immediately available to PA-RISC licensees, which include Hitachi Ltd., Convex Computer Co., Stratus Computer, Inc., Mitsubishi Electric Corp. and others.

Better little than big

The bi-endian chip is intended to move HP workstations and minicomputers into the Windows NT world via its "little endian" byte-ordering scheme, which arranges bytes in ascending order — a manner more suited for NT than HP's descending big endian-only design.

But the 7100LC was designed as a "low-cost" chip, and at a maximum of 80 MHz, does not offer the performance levels of faster PA-RISC processors. HP has earmarked it for low-end workstations and minicomputers.

Silverman pointed out, however, that the chip includes built-in multimedia support for image processing, a memory controller and an I/O controller, thereby reducing the cost of building that support on a system motherboard. The chip also uses off-the-shelf static RAM for cache support, compared with the more expensive RAM the 7100 requires.

Double offering

Reversing an earlier public statement, HP last week said it will offer its forthcoming "bi-endian" PA-RISC 7100LC in both the HP 3000 and HP 9000, as well as in its workstations. The company plans to unveil low-end systems using that chip next month.

Meanwhile, HP is cranking up the speed of the 99-MHz 7100 to 125 MHz in a chip intended solely for workstations.

Called the PA-7150, the chip will continue in the 7100's big endian-only vein, meaning it is not intended to support NT.

But HP has another processor on the drawing board, the PA-7200, that will provide NT support through a bi-endian design while also representing a performance boost, Silverman said.

The PA-7200 is due in late 1994 or early 1995 and will include higher bandwidth, lower latency, a dual-integer pipeline and more efficient cache management, he said.

HP will move to a 64-bit design in 1995 with the PA-8000 and to post-RISC in 1997 or 1998 with the PA-9000, Silverman said.

Minicomputers

Large systems users not waiting for NT

By Mark Halper

■ **As Hewlett-Packard Co. edges toward support for Microsoft Corp.'s Windows NT operating system on its minicomputers, it is business as usual for many of HP's large systems customers, who do not see NT in their near-term, enterprise-level future.**

Users view HP's NT endeavor as a logical marketing ploy in which HP is preparing to offer NT support when and if the fledgling operating system catches on at both data center and departmental levels.

HP is altering the PA-RISC chip that drives its proprietary HP 3000 and Unix-based HP 9000 minicomputers so that the chip will more readily accept an NT port [CW, Dec. 13]. HP is adding a "little endian" byte ordering scheme to PA-RISC's "big endian" design, a move that will greatly ease any eventual porting task (see story above). A little endian model arranges bytes in ascending order, while a big endian scheme arranges them in a descending fashion.

John Jazwiec, chief information officer at Barber-Colman Co., a Rockford, Ill., vendor of environmental and industrial controls, noted that he has a long-term commitment to the HP/UX Unix operating system on his high-end Corporate Business System HP 9000s.

Slow start at high end

"Will NT catch on at the high end? Not in the 1990s," Jazwiec observed, noting that NT is a long way from acceptance as an industrial-strength operating system with the reliability sought by information systems chiefs.

He sees a possible NT opening, however, in departmental servers. "The operating system for that level is still undecided," Jazwiec said. "I think NT is going to be strong because of the number of applications that can be ported to it." He added that it would be a plus to buy servers and data center equipment from the same vendor.

Jerry Kopecky, manager of MIS operations at IVI Travel, Inc., a Northbrook, Ill., HP 3000 and 9000 shop, said an NT-compatible PA-RISC machine would be more confidence-inspiring than an enterprise-level NT machine based on an Intel Corp. architecture.

"It would make me nervous running a corporatewide data center on an Intel architecture," Kopecky noted. "This seems to be one of the first initial attempts at putting a solid architecture out there" with NT.

Steve Dennehy, second vice president of strategic planning at Massachusetts Mutual Life Insurance Co. in Springfield, Mass., said he has no intention of migrating his HP 9000 boxes to NT. "All it would provide would be a different operating system. There would have to be some considerable value added," he said.

Rodger Lindquist, manager of business systems development at Bio Rad Laboratories, Inc. in Hercules, Calif., noted that offering an NT solution will help HP stem possible customer defections, such as the switch made by Lindquist's former employer. Dryer Grand Ice Cream, Inc. in Oakland, Calif., ditched its PA-RISC-based hardware for a less expensive Intel-based system from Sequent Computer Systems, Inc., Lindquist said.

Meanwhile, bringing NT into an operating system fold that also includes MPE/IX and Unix means HP will have to carefully ensure its existing customers that it is not refocusing its efforts away from them. Not long ago, MPE/IX users feared abandonment as HP began staking its future on Unix. HP has taken strong measures to douse those incendiary concerns but will now have to work extra hard at making sure the flames stay out.

"This will certainly cause the HP spin controllers to start spinning real hard," said Eric Fisher, principal at Fisher Systems Consulting in Groton, Mass.

HP to field two low-end workstations, small Unix server

Based on modified PA-RISC chip, machines are aimed at attracting commercial customers

By Jean S. Bozman

CUPERTINO, CALIF.

Hewlett-Packard Co. is expected to unveil two low-end workstations and a low-end server based on the new HP PA-RISC 7100LC chip next month, industry analysts said last week.

At the same time, HP confirmed that the 7100LC, a bi-endian chip, will power Unix workstations and low-end Unix servers when they ship early next year (see story page 14). All of the systems will run Unix off the bat but were designed to operate with Microsoft Corp.'s Windows NT [CW, Dec. 13].

The workstations, said to be priced at $3,995 and $8,800, will bring HP into direct competition with Sun Microsystems, Inc.'s Classic and LX workstations, Silicon Graphics, Inc.'s $5,000 Indy machine and IBM's PowerPC-based workstations. HP is also set to announce a small HP 9000 Model 800 "E" workgroup server priced at about $7,500, analysts said. Until now, the $5,000 HP 9000 Model 715 was the least-expensive HP workstation.

We're No. 2

HP is the No. 2 Unix workstation player. Last year, it trailed Sun's 35% market share with a 17% share, according to International Data Corp.

Commercial sites have anticipated the entry-level workstation for several months.

"It would be good for small workgroups," said Mike Emrick, a systems analyst at Wachovia Bank in Winston-Salem, N.C. "Banks have literally hundreds of branches, and you could serve 10 X terminals off one small server."

Emrick said he plans to test the new systems running Windows business applications under Sun's Wabi. Analysts said they expect 486 PC users to evaluate the low-end HP workstation as a move-up box. Meanwhile, some technical users said last week they expect to stick with their high-end machines.

Open to NT

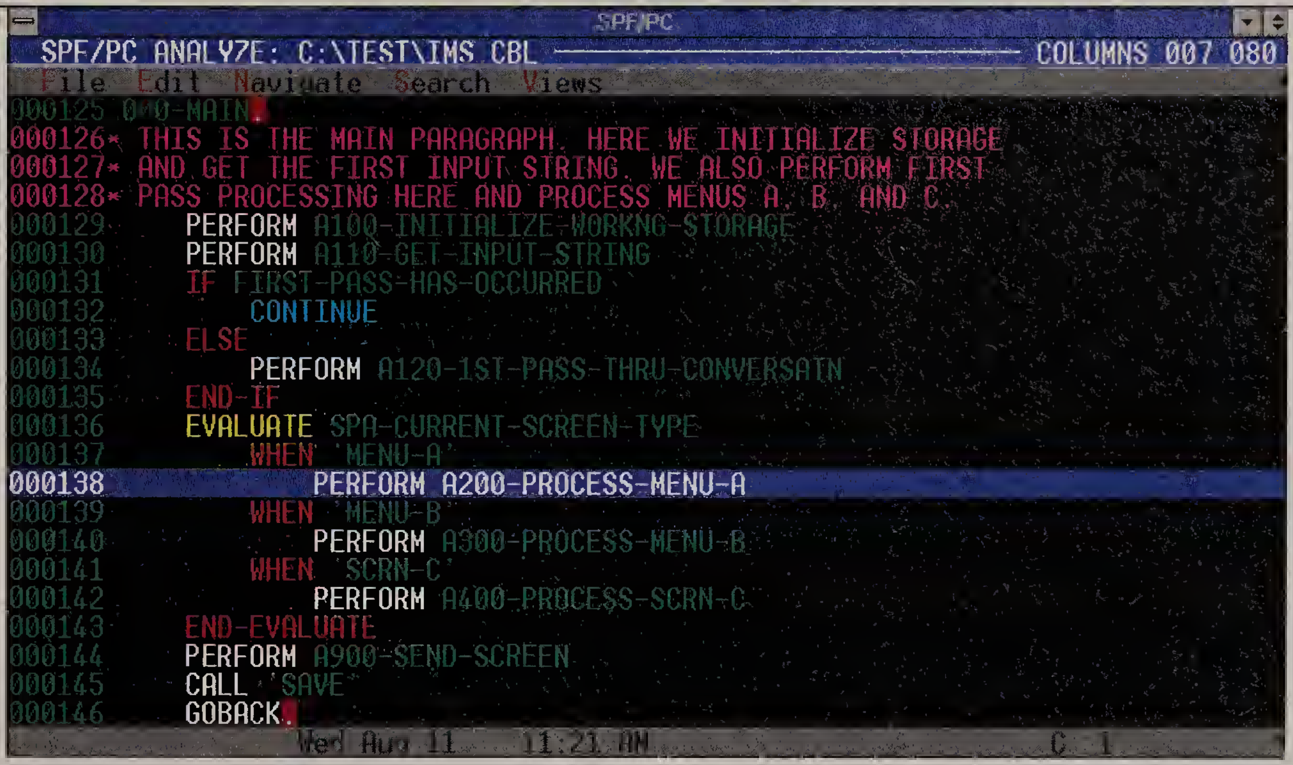
By using the new 7100LC bi-endian chip, HP is providing an engine so inexpensive that it can vie with high-end PCs, and the firm is also leaving the door open to Windows NT. "If they see themselves losing business because they're not offering NT, then I believe they will offer it," said Paul McGuckin, a Unix analyst at Gartner Group, Inc. in Stamford, Conn.

A mature workstation market, with 16% yearly growth, is driving many vendors to provide desktop alternatives for the booming PC market, said Nancy Battey, director of workstation research at International Data Corp. in Mountain View, Calif. "They're in a tumultuous environment where they've got to decide if they want to stay in high-end workstations, which represent under 2% of the overall desktop market," she said.

But other analysts noted that the move-down strategy will result in price pressures and user demands to support Windows applications, even those not supported by Wabi.

Multimedia and video applications will be supported directly on the 7100LC chip, HP said last week. "There will be no additional hardware needed for JPEG and MPEG decompression," said Larry Inman, program manager for advanced technologies marketing at HP's computer systems group here. JPEG and MPEG are the two leading video-compression algorithms, he said. Analysts said putting video-compression directly on the chip should speed throughput.

Other HP workstations do require video-compression cards from third-party suppliers.



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SPF/PC ANALYZE: C:\TEST\IMS CBL ─────────────────── COLUMNS 007 080
000125 000-MAIN.
000126* THIS IS THE MAIN PARAGRAPH. HERE WE INITIALIZE STORAGE
000127* AND GET THE FIRST INPUT STRING. WE ALSO PERFORM FIRST
000128* PASS PROCESSING HERE AND PROCESS MENUS A, B, AND C.
000129     PERFORM A100-INITIALIZE-WORKNG-STORAGE
000130     PERFORM A110-GET-INPUT-STRING
000131     IF FIRST-PASS-HAS-OCCURRED
000132         CONTINUE
000133     ELSE
000134         PERFORM A120-1ST-PASS-THRU-CONVERSATN
000135     END-IF
000136     EVALUATE SPA-CURRENT-SCREEN-TYPE
000137         WHEN 'MENU-A'
000138             PERFORM A200-PROCESS-MENU-A
000139         WHEN 'MENU-B'
000140             PERFORM A300-PROCESS-MENU-B
000141         WHEN 'SCRN-C'
000142             PERFORM A400-PROCESS-SCRN-C
000143     END-EVALUATE
000144     PERFORM A900-SEND-SCREEN
000145     CALL 'SAVE'
000146     GOBACK.
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News Shorts

Former AT&T employee sentenced

A former AT&T employee and his uncle were sentenced to 18 months in prison for conspiring to extort $1 million from the communications giant. Federal prosecutors in Newark, N.J., said Louis Pacich, a former AT&T project coordinator, admitted to stealing computerized records from 4,000 customer accounts last April. Pacich's uncle, Richard Vignevic, then contacted AT&T and falsely warned the vendor that one of its employees was selling account information to AT&T competitors. Vignevic demanded $1 million from AT&T to plug the leak, prosecutors said.

Frame relay standard approved

The **Frame Relay Forum** agreed on a technology that should improve frame relay's performance as a wide-area transport mechanism in multiprotocol networks. The agreement standardizes the way frame relay transports or encapsulates the various protocols within a field, shielding the protocols from network interpretation until they arrive at the terminating router or bridge.

ThinkPad 500 back on shelves

IBM PC Co. says its ThinkPad 500 subnotebook is shipping again. The battery problem was fixed by replacing the unconventional lead-acid battery with a more conventional nickel-metal hydride battery. An IBM spokesman said current users will get two of the new batteries and a portfolio carrying case. IBM will pick up, update and return the system within three to five days. Customers should call IBM at (800) 426-7244.

Dell, Zeos release Pentium PCs

Two vendors released Pentium product lines last week. **Dell Computer Corp.**'s OmniPlex becomes the high-end Dell desktop, with 60- and 66-MHz processor models available. A model with 8M bytes of RAM, a 120M-byte hard drive and a super VGA monitor will cost $3,799. **Zeos International Ltd.**, meanwhile, will take the low-cost road with eight Pentium systems starting at $2,495. They use the Peripheral Component Interconnect bus.

Apple groupware to ship next month

Look for full availability of **Apple Computer, Inc.**'s PowerShare Collaboration Server software at next month's Macworld Exposition. PowerShare software provides System 7 users with a workgroup computing framework that includes server-based messaging, shared catalogs and network security services on AppleTalk networks. It will carry a price of $999.

SHORT TAKES **Reuters Holdings PLC** of London will purchase **Teknekron Software Systems** in Palo Alto, Calif., for $125 million. Teknekron provides software and systems integration for distributed systems used in digital trading. . . . **Novell, Inc.** has released an enhanced version of its NetWare HostPrint software, adding PostScript support, enhanced fault tolerance and support for its NetWare for SAA that makes any networked printer, including Unix printers, available for an IBM host job. . . . **Iowa Network Services, Inc.** will use routing equipment from **Wellfleet Communications, Inc.** over the next year to add services to its 1,300-mile fiber-optic network for delivering voice, data and Internet connectivity to subscribers. . . . **Cisco Systems, Inc.** and **Cascade Communications Corp.** said they will jointly develop a router/switch product for delivery in the second half of 1994. The product will handle wide-area networking technologies such as Asynchronous Transfer Mode and frame relay on the same platform as LAN routing Internet Protocol and Open Systems Interconnect routing.

Chicago

CONTINUED FROM PAGE 1

The developer said his company, which has 15,000 PCs, is not likely to upgrade from Windows 3.1 unless Chicago includes the so-called .INI files. Microsoft's decision to eliminate the .INI files was to simplify systems management, observers said.

What makes Microsoft's forecast of 50 million sales so bold is that it said it can achieve the figure with or without the availability of a rich selection of fully exploitive 32-bit applications. The company said it believes 35 million copies can be sold through bundling deals with hardware suppliers and another 15 million through retailers.

Microsoft is expected to benefit from continued PC sales growth next year — some 40 million units, according to International Data Corp. — and the expected user enthusiasm for Chicago's more advanced features, such as preemptive multitasking and an object-oriented interface.

Developing starts now

While Microsoft officials declined to comment on projections made at the conference, they said there is no reason why developers cannot do a lot of significant development work immediately. "I think it is a gross exaggeration to say you can't start writing applications; 32-bit applications were demoed at the conference," said Windows product manager Jeff Thiel.

Microsoft distributed more than 5,000 software development kits for Chicago at the conference, bringing the total number of kits shipped so far to well over 6,000, according to Microsoft officials. Microsoft demonstrated the latest pre-beta alpha version of Chicago — called Version 4.00.58s or Alpha II — running 32-bit Windows applications such as Micrografx, Inc.'s Picture Publisher and others.

Developers voice doubts

Developers at the conference said they were generally satisfied with the latest version's ability to run 32-bit Windows applications but wondered how efficiently it would ever run existing 16-bit Windows applications. Microsoft has readily admitted that much of the performance tuning for the product has yet to be done.

One beta user who was not at the conference but who received Alpha II early last week was disappointed with how slow it worked even on a 66-MHz 486 with 8M bytes of memory. "The file system appeared pretty slow. It takes a very long time to do things like open up folders," another user said. "And when you click on the [folder's] tabs, the screens are empty. They have some work ahead of them yet."

Some features that impressed beta users included a "network globe," which presents network administrators with a tree structure of all PCs on a LAN, and PC access to networked peripheral devices.

This alpha also adds smart menus invoked by the right mouse button; minimized applications now appear on a tool bar; and users now deal with files through a tree metaphor.

Exploring Cairo

Microsoft last week gave its most extensive demonstration of Cairo, the object-oriented follow-up to its Windows NT operating system, showing off the product's sophisticated search utility.

Called Explorer, the built-in utility can search for and locate specified data files and their attributes across multiple networks, depending on an individual user's designated access.

"It doesn't matter which application created the file or where it was created, [Explorer] can pull it in," said one developer at last week's conference.

The purpose of the demonstration was to flex the muscles of Cairo's 32-bit object-oriented file system. Microsoft officials advised developers to start developing an expertise in the technology now.

—Stuart J. Johnston and Ed Scannell

Symantec fires up C++

By Melinda-Carol Ballou

The game of one-upmanship in the C++ tools arena knows few boundaries.

As Microsoft Corp. unofficially previewed features for its upcoming release of Visual C++ last week, Symantec Corp. unveiled and began shipping Symantec C++ 6.1, which already supports a number of comparable features, Symantec officials said. The stage for all of this was Microsoft's home turf at its Professional Developers Conference.

Plans for new features

Microsoft began shipping Version 1.5 of its Visual C++ 16-bit tools as expected [CW, Oct. 28] and announced plans for the mid-1994 release of features in its 32-bit Version 2.0 such as hierarchical project management, a slicker user interface and drag and drop across multiple views for the development environment, according to developer sources briefed at the show.

However, Symantec said it will ship those capabilities this month, although they refused to comment directly on the Microsoft products. Borland International, Inc. announced its latest round of tools last month [CW, Nov. 22]. Microsoft did not comment by press time.

In addition, the Symantec tools will offer template debugging support, 32-bit Microsoft Foundation Classes and a customizable color syntax editor.

Beta testers of Symantec 6.1 said the new project management support helps them to coordinate their work.

"We are making constant enhancements, and the only way that we are able to set up a standard is through project management," said Babu Sonti, senior systems analyst at Union Central Life Insurance Co. in Cincinnati. He added that version control is also important.

With Version 6.1, Symantec added integrated version control, incorporating Intersolv, Inc.'s PVCS and adding a graphical front end and allowing developers to do merges between different versions of software via dialog boxes.

Sonti expressed confusion about Symantec's foundation class strategy.

While Symantec is supporting Microsoft Foundation Classes in its C++ tools, it is developing another set of foundation classes for use in Bedrock, a cross-platform development technology that it is jointly creating with Apple Computer, Inc. (see story page 69).

Pushing OLE

Microsoft made a big push for Object Linking and Embedding (OLE) at last week's conference. Visual C++ 1.5, for instance, now offers Microsoft Foundation Classes 2.5 that support Open Database Connectivity, OLE 2.0 and OLE wizards that will allow developers to create OLE clients with the click of a button.

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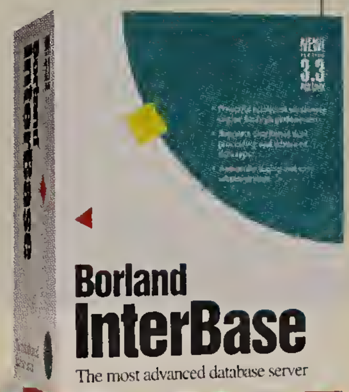

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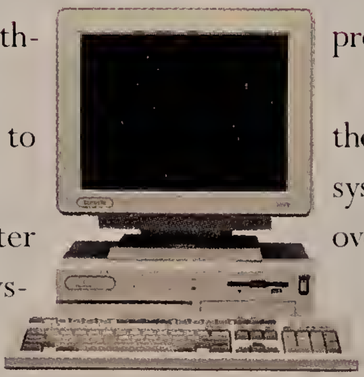

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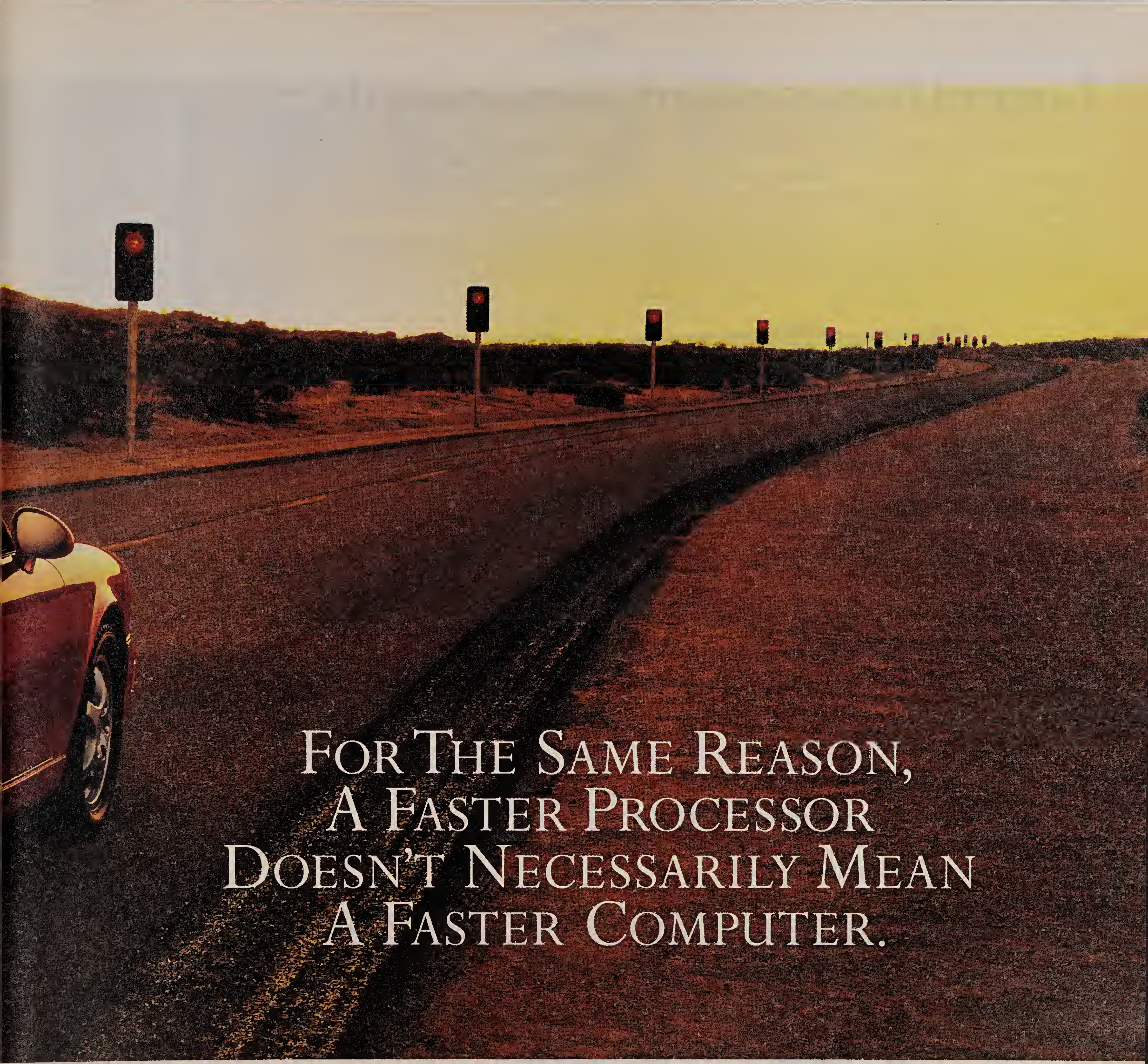

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Legent flexes client/server deals

Trade-in offer covers host software for five years

By Gary H. Anthes

Responding to pressure from budget-conscious users, Legent Corp. last week unveiled software licensing options intended to give users more flexibility and cost predictability when upgrading mainframes or moving from host to client/server systems.

By paying a onetime premium — 25% of the mainframe software's list price for a new purchase or 35% for an installed product — users earn the right to a trade-in credit if they buy that product's client/server equivalent from among the Cross-Platform Environment (Xpe) line within five years. The trade-in allowance shrinks from 75% to 10% of the mainframe product's list price at the end of the five-year period.

The program, called Flexplan, also does the following:

- Lets users upgrade through as many as three IBM mainframe tiers at no charge.
- Allows users to move a product from one mainframe to another any number of times at no charge.
- Guarantees no increase in maintenance costs during the five years.
- Removes authorization codes, which can be used to disable software in a dispute with a customer, from covered products.

Flexplan marks the second round of pricing option announcements this year. In February, Legent announced price-cap options and other licensing alternatives [CW, Feb. 15].

Attractive proposition

Dan Jones, information systems vice president at Meridian Bancorp in Reading, Pa., said his company had not yet decided to buy into Flexplan but that the concepts are attractive. "We have been working with a lot of our software vendors to come up with flat software charges," he said. "We want to be able to upgrade a processor and not get hit with a couple of hundred-thousand dollars in software upgrade fees."

"Everyone is going to client/server. We happen to believe the mainframe will be one of the servers." —John Burton, Legent CEO

"What's important about this is the concept of residual-value credit," noted Karen Cone, program director of the Software Asset Management Service at Gartner Group, Inc. in Stamford, Conn. "We think the concept should be applied throughout the software licensing world."

However, Cone cautioned that Flexplan carries a stiff price tag for some users. "It isn't cheap. So I think it's only interesting for those customers who are quite sure they'll make a change in the next five years," she said.

John Burton, Legent president and chief executive officer, acknowledged that Flexplan will be most advantageous to users who are planning to upgrade their mainframes or move to client/server. "But everyone is going to client/server," Burton said. "We happen to believe the mainframe will be one of the servers."

Burton also said Legent would offer users an option for "MIPS-based licensing," in which free upgrades could be made within a performance band measured in MIPS.

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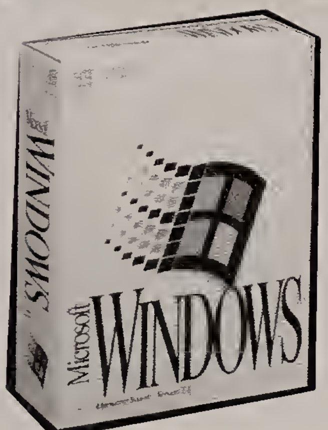

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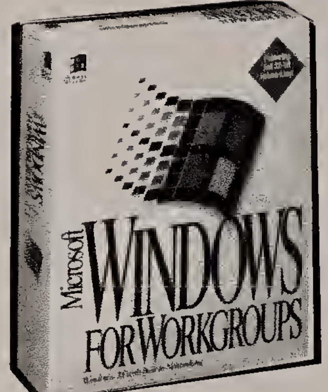

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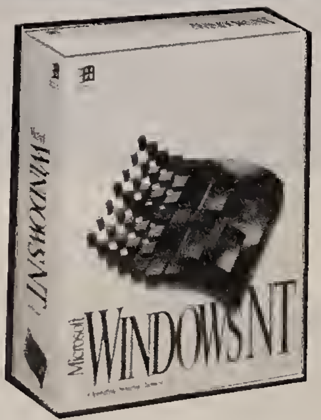

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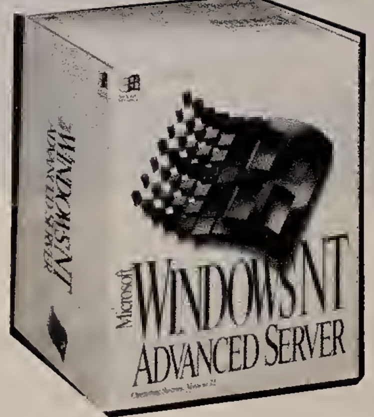

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Vol. 10, #11, November 1993

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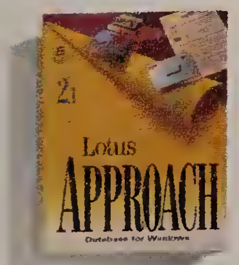

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Feds renovate by rebuilding E-mail

CONTINUED FROM PAGE 1

sential to government," said Thomas B. DeWitt, integrated telecommunications services manager at the GSA, which is behind a number of the E-mail initiatives. "The train is leaving the station. Be on it or be under it."

Slow to catch on

But while the president's National Performance Review calls for seamless communications across agencies and to the public through a "government information infrastructure," E-mail is still in relatively limited use, confined mostly to isolated pockets at individual agencies. Interagency E-mail is difficult to use, slow and unreliable (see chart at right).

Some observers worry that the government is building an electronic Tower of Babel that will not be able to deliver seamless service to millions of users.

"Individual agencies are building their own E-mail systems," said Dan Schneider, chairman of the interagency Working Group on Governmentwide Electronic Mail and a computer specialist at the Department of Justice. "The IRS is talking independently to the telecommunications carriers, the Social Security Administration is pursuing it independently, the National Institutes of Health is, too, and so forth."

Government officials readily acknowledge the shortcomings of the E-mail infrastructure but said they will address them as part of the National Performance Review-sponsored Governmentwide E-Mail Pilot Project.

Post pattern

The E-mail working group, in a recently published report, said building a nationwide E-mail system modeled after the U.S. Postal Service (USPS) was superficially attractive but had no political support and was therefore unlikely. According to the report, "The national solution would contract for physical circuits all over the country and would install its own switches and routers, thereby blanketing the nation and providing the same ubiquity for E-mail as the USPS provides for postal mail."

Actually a collection of test projects, the interagency effort is intended to introduce electronic messaging to several agencies with widely divergent user needs and to use the lessons learned from those pilots to develop plans for long-term, governmentwide E-mail and commerce (see story page 25).

"I'm just delighted to see the administration pushing this," said Dan Lynch, chairman of Interopin in Mountain View, Calif. "Anything that encourages peer-to-peer communications in a service organization is a big benefit to everyone."

Building a bridge

The most feasible approach to interoperability, at least in the short term, is allowing users to keep their current E-mail systems while using technology to bridge them, according to Assistant Commissioner Michael Corrigan, director of the GSA's Office of Telecommunications Services.

The viability of that approach could be enhanced by giving agencies guidelines such as "Don't buy an E-mail system for which there is no X.400 or [Simple Mail Transport Protocol] gateway," he explained.

DeWitt said the question of whether some central party such as the GSA should dictate a "grand design" for E-mail, or whether it should simply be allowed to evolve from the bottom up, has not been answered. It is one of the issues on which the pilot projects are expected to shed light. "We are trying to see if the existing infrastructure meets our needs," he said.

> "As in the business world, electronic messaging is becoming essential to government."
>
> *—Thomas B. DeWitt, General Services Administration*

The interagency E-mail working group has recommended that the government build a unified federal government E-mail users' support environment (MUSE) consisting of comprehensive directory services, interfaces and standards by which disparate E-mail systems in and out of government could transparently interoperate.

Rather than having the government limit its E-mail use to nonfederal networks and commercial E-mail services and products, those services and products "should be required to accommodate to the published standard interface and discipline of the MUSE," the working group said in a recent report (see story page 25).

Schneider estimated it would cost $30 million to $40 million to implement the MUSE if it were built on top of existing networks and information systems resources at an agency such as the Department of Health and Human Services.

The MUSE is the right approach, said Warren Suss, president of Warren Suss Associates, a consulting firm in Jenkintown, Pa., that specializes in high technology in the government. "Agencies need to be empowered to make their own decisions on [E-mail] for their own environments, but at the same time, the government wants to make sure it can talk across agencies to get business done," he said.

Corrigan called the MUSE "an interesting idea" and said it is the concept adopted this year by the German government, which ensured interoperability by putting common "message transfer agents" in front of each agency.

"But end-to-end capabilities can't be put on gateways," he said. "User-to-user confidentiality requires something on each PC. Security is not handled at all well with a gateway."

Kinder, gentler E-mail

Regardless of what shape the E-mail infrastructure ultimately takes, it is clear that the existing setup could be more efficient and user-friendly. Although the roundabout routing of interagency E-mail is generally transparent to users, as messages get larger and as volume increases "inefficiency may escalate," DeWitt said.

The GSA is considering establishing a high-speed metropolitan-area network to eliminate that circuitous routing.

There are now some 50 X.400 gateways between agency LANs and the Federal Telecommunications System-2000 (FTS-2000) packet networks, Corrigan said, which have been in place for less than 18 months. Interagency E-mail traffic through the gateways is still relatively small but is beginning to show "rapid exponential growth" as users become aware of the reach the gateways offer.

Another challenge users face is the lack of governmentwide directory services, a shortcoming that many commercial E-mail users also see. Not only is it often difficult to learn the E-mail addresses of people outside one's own agency, but even when addresses are known, the long and complex X.400 addresses are difficult to remember.

Information gap

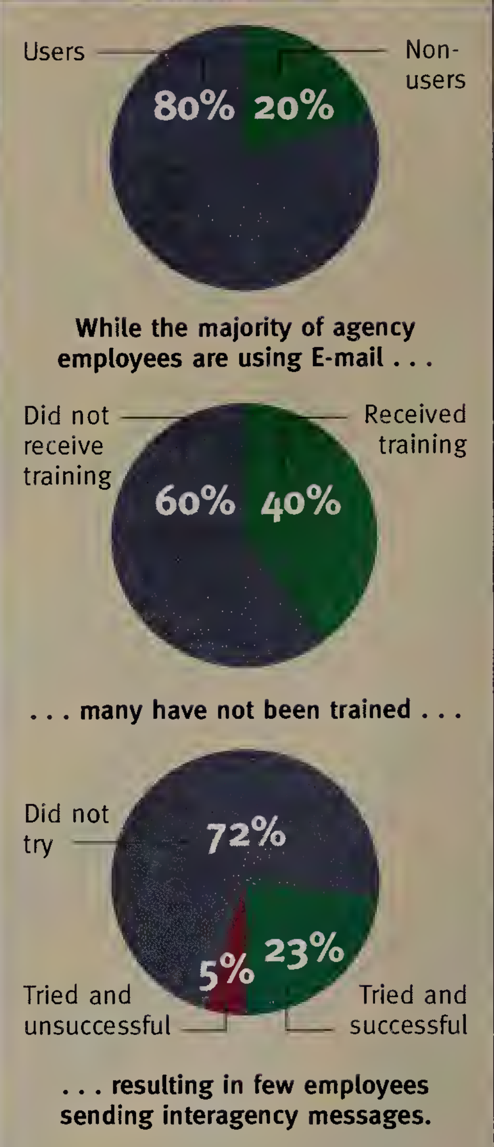
Most people do not know their own X.400 addresses or, indeed, that they even have them, according to Corrigan. "Training is fast rising to the top of our list of issues," Corrigan said. "We're at ground zero on a lot of this stuff."

Corrigan said commercial products for distributed, X.500-based directory services that could solve these problems are not yet mature.

Currently, a half-dozen agencies are going through a labor-intensive synchronization effort in which they send in their E-mail lists to a single point where they are merged and sent back.

About 3,000 names are now on the consolidated list, but 100,000 more could be added immediately if the system had more capacity, said Martin Smith, chairman of an interagency directory services group.

Neither rain, nor . . .



While the majority of agency employees are using E-mail . . .

. . . many have not been trained . . .

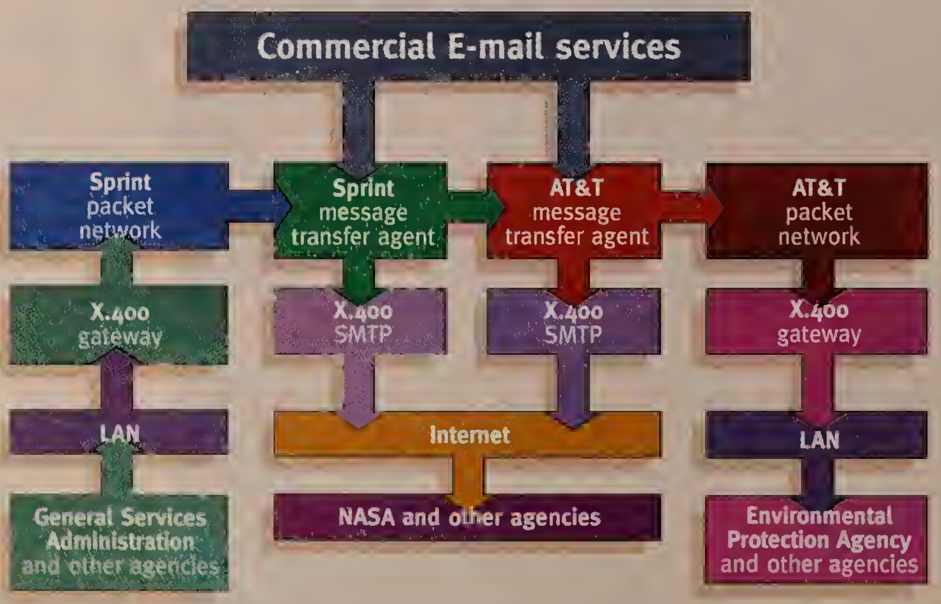
. . . resulting in few employees sending interagency messages.

TOTAL NUMBER SURVEYED: 89
75 from Office of Management and Budget,
14 from Office of Science and Technology Policy

Source: General Services Administration, Washington

Message morass

An E-mail message sent from the General Services Administration to the Environmental Protection Agency travels the following route. Other users receive messages via the Internet.


Commercial E-mail services
Sprint packet network
Sprint message transfer agent
AT&T message transfer agent
AT&T packet network
X.400 gateway
X.400 SMTP
X.400 SMTP
X.400 gateway
LAN
Internet
LAN
General Services Administration and other agencies
NASA and other agencies
Environmental Protection Agency and other agencies

Source: General Services Administration, Washington

Agencies push to upgrade E-mail use

By Gary H. Anthes

The White House Office of Science and Technology Policy wants to be a "model agency" for the Executive Office of the President in the use of E-mail.

In its pilot project, the science and technology office will get a direct 1.5M bit/sec. connection to the Internet for communicating with science and technology officials throughout the government.

Later, the systems will encompass all of the executive office and will provide packet video, digital signatures and other advanced services.

Eliminating the paper chase

The Office of Management and Budget's Legislative Reference Division serves as a clearinghouse for all executive branch agencies in their dealings with Congress. At present, it uses photocopiers, fax machines and couriers to move documents, such as draft legislation, around Washington for agency review. Sometimes these reviews must be completed in a matter of hours, a nearly impossible task. The office hopes that E-mail will eliminate the paper chase and greatly expedite reviews.

The National Security and Emergency Preparedness Office will use E-mail to boost the efficiency of its communications with 23 agencies that are part of the National Communications System, which was set up in the wake of the 1962 Cuban Missile Crisis to coordinate government response to emergencies.

Currently the office relies on telephone, fax, the Internet and whatever E-mail system each of the agencies has in place.

Interest in E-mail

The Administrative Conference of the United States, a government think tank that advises government agencies, does not use E-mail but wants to use it for its work in "alternate means of dispute resolution." It would use a network to make available training materials, models of dispute resolution and other materials to streamline the way disagreements are resolved.

"The E-mail labs are looking beyond transport and standards," said Warren Suss, president of Warren Suss Associates. "They are really trying to understand how to use the technology more effectively. It's a business process improvement issue."

Major Widget saves

No party will benefit more from the emergence of a unified E-mail users' support environment (MUSE) than large corporations, according to a federal interagency E-mail working group.

In a recent report, the group outlined the role of the MUSE for the hypothetical Major Widget Corp.:

- Widget's chemical subsidiary deals regularly with the Environmental Protection Agency (EPA). Using E-mail with encryption for authentication, Widget sends messages, maps, engineering drawings and scanned photographs to the EPA.
- The Occupational Safety and Health Administration (OSHA) sends bulletins and regulations to Widget by E-mail. OSHA has set up broadcast distribution lists by subject, geography and industry for this purpose.
- Widget found that using E-mail greatly reduced the time needed to get an export license from the Department of Commerce.
- The company used E-mail for dealing with the Securities and Exchange Commission on a new common stock issue and with the Department of Justice and the Federal Trade Commission when it acquired another company.

—Gary H. Anthes

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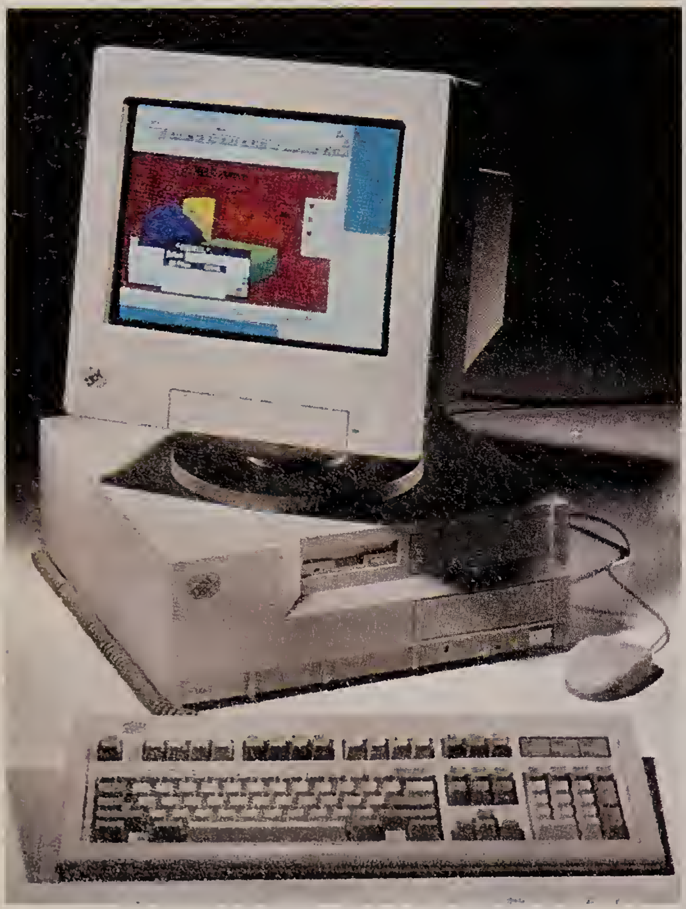

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*P60/D available starting at $4,999,** including 15″ SVGA monitor.*

It also offers double the capacity of any standard 486, with 16KB of L1 Cache and 256K L2 Cache. What's more, this chip acts like it has a mind of its own. In fact, it's almost clairvoyant. Which means that the P60/D can put

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PC vendors warm up to RISC technology

By Michael Fitzgerald and Ed Scannell

Industry hype aside, RISC-based PCs are not considered ready for prime time by users. And many PC makers are regarding them with caution as well.

PC vendors, however, are looking seriously at RISC processors for their next-generation servers. The evaluation is being driven by information systems managers such as Douglas Murphy, director of IS at Comcast Corp. "We're looking at [RISC vs. CISC] right now. We've made the decision to make the mainframe go away, and now the question is what do we replace it with," he said.

Some users have investigated multiprocessors based on Intel Corp.'s complex instruction set computing (CISC) chips to avoid Unix. But Intel's perceived lack of processing power and the complexity of building multiprocessing-capable software have slowed this market.

Symmetrical multiprocessing software is difficult to write, both on the operating system side and the application side. This means a RISC chip with good software support could outstrip Intel's performance and win business because of it.

"In the real world, it's always harder to get performance out of [symmetrical multiprocessing] than out of a uniprocessor box," said G. Glenn Henry, Dell Computer Corp.'s chief technology officer.

To fix this, Intel is beefing up its multiprocessor strategy behind symmetric multiprocessors, an approach that rings true with PC makers such as Compaq Computer Corp. and AST Research, Inc.

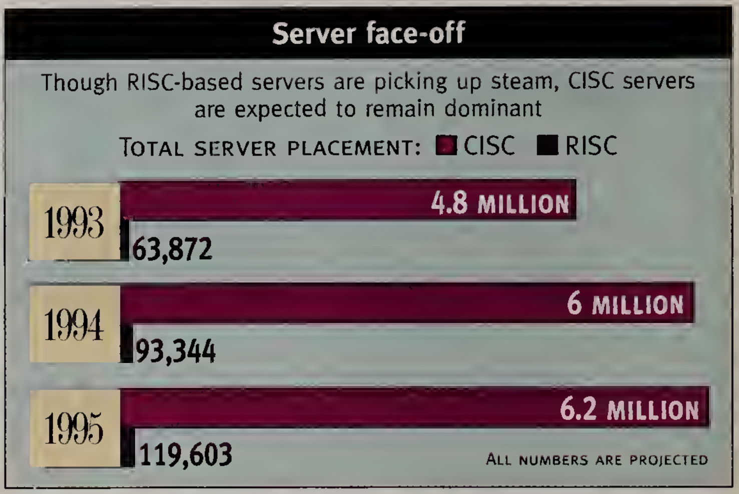
Users, however, said they are concerned that symmetrical multiprocessing support is still lacking. "I just had this conversation with Compaq, and the issue is, nobody's software exploits the capabilities" of symmetrical multiprocessing, said Allen Cournyer, senior vice president at Texas Commerce Bank in Houston. "I'd just as soon spend another $10,000 for a second server and have two boxes."

Analysts agreed that RISC vendors have a chance to establish a beachhead, though not a great one.

"Corporations don't look at RISC vs. CISC as an important differentiator," said William Bluestein, an analyst at Forrester Research, Inc. in Cambridge, Mass. Bluestein said the key for corporate users is to run software painlessly.

And because software, not hardware, is important to users, analysts said RISC vendors cannot get in the door until they have a level playing field in the application environment. This may hitch RISC hardware success to that of Microsoft Corp.'s multiplatform-capable Windows NT and IBM's WorkPlace OS, which allows multiple open systems to run on top of a microkernel, and the Taligent object-oriented environment.

Windows NT, built to run in single- or multiple-processor configurations, is the market's great digital hope. Meanwhile, OS/2 will soon be available in a symmetrical multiprocessing version. Vendors, however, said symmetrical multiprocessing software remains a challenge.



Source: WorkGroup Technologies, Inc., Hampton, N.H.

Assessing the RISC

While some very large vendors support RISC PCs and servers, most build RISC chips or are part of an alliance to build a RISC processor.

The mainstream of disinterested PC makers, including Compaq, Dell and AST, have refused to publicly commit to adding a RISC architecture to their product lines.

But Compaq President and Chief Executive Officer Eckhard Pfeiffer recently said, "We are looking very closely at [IBM's PowerPC]. It is the first product that has the potential to be the base for a RISC standard."

Pfeiffer could not resist taking a potshot at IBM, however. "Customers want a clearer message regarding [IBM's] plans for Intel and RISC," he said, suggesting that IBM should pick one business or the other.

James A. Cannavino, IBM's top technology executive, responded in a separate interview: "Eckhard asking us to choose between Intel and RISC is like asking GM to choose which cars it wants to stop selling. I intend to be in both markets and run them both at a profit."

IBM may be able to back up these ambitions given that it is the one company involved in the RISC market that can control its own destiny. IBM's chip manufacturing technology is arguably the best in the world and could fend off any aggressive price-cutting strategies by Intel.

Dell, which has a number of rumors swirling about its intentions, acknowledged that it has RISC prototypes up and running in its lab, but several officials have said these prototypes may never see the light of day.

"Look, monopoly is not good, and the profit distribution in the industry has to change, but we're not a market maker, we're a market taker," said Joel Kocher, Dell's president of marketing, in a recent interview. "We're a wait-and-see company, but right now we think Intel has a very strong argument going for it." *—Ed Scannell and Michael Fitzgerald*

Vendors align on info highway pieces

By Gary H. Anthes

WASHINGTON

■ A pair of corporate alliances announced last week signal that users and vendors alike are beginning to take seriously the much talked-about and emerging National Information Infrastructure (NII).

Twenty-eight companies — mostly computer and communications concerns — formed the Cross-Industry Working Team, a coalition intended to help define the architectural and technical requirements for the NII, as proposed by the Clinton administration.

Calling itself the XIWT, the group — including AT&T, Apple Computer, Inc., IBM, Intel Corp., Cable Television Laboratories, Inc., Nynex Corp. and others — will create a forum for technology discussions, develop architectural approaches that bridge industry gaps, plan pilot projects and advise the administration as needed, said Robert E. Kahn, president of Reston, Va.-based Corporation for National Research Initiatives, a nonprofit concern that organized the effort.

At a press conference here to announce the XIWT, members said they will focus on issues such as openness, interoperability, robustness, security, privacy, integrity and ubiquity of access.

Kahn said the group is not a standards-setting body, is not applications-oriented and will not attempt to dictate specific technologies to be used in the NII.

The NII has no precise definition, but is thought of as a high-capacity digital internetwork offering two-way communications in data, audio, video and images to businesses, schools and homes.

Citicorp, one of the few user organizations in XIWT, hopes to benefit by learning how it can use the NII to more effectively and efficiently serve its customers, said Dan Schutzer, vice president and director of advanced technology. "We believe in the virtual bank," Schutzer said. "More and more people will do their banking away from branches — at home, on the road, in the shopping mall. Wherever they are, they'll tap into us via public networks."

Schutzer said he also sees Citicorp's XIWT membership as a way to ensure that the NII does not evolve in ways that are not friendly to distributed financial applications such as funds transfer, billing and shopping. "We want to make sure it can get to the public in a usable, secure and affordable way and that we can build applications reasonably," he said.

While the XIWT focuses on technology, it is coordinating efforts with the 21st Century Infrastructure Project of the private-sector Council on Competitiveness, which focuses on matters of policy and applications (see story at right).

Setting policy

The Council on Competitiveness last week released a report on competition policy and the National Information Infrastructure. It found that technology and markets are fusing and regulations and policies are fragmented.

Therefore, it is impossible to predict the future of the markets or technology. Given those factors, "the key issue is not whether, but when and under what conditions, to permit full competition in all markets," the council concluded.

The council made these recommendations:

- Ensure interconnection and interoperability among networks. Telecommunications providers should unbundle their services and make them available in a building-block approach.
- Remove barriers to market entry. Allow telephone companies into the cable market, cable companies into the telephone business, local providers into long-distance and so forth. Put in regulatory safeguards to prevent unfair practices.
- Let prices reflect competitive market conditions.
- Protect universal service and share its costs among providers. Subsidize end users, not providers.

—Gary H. Anthes

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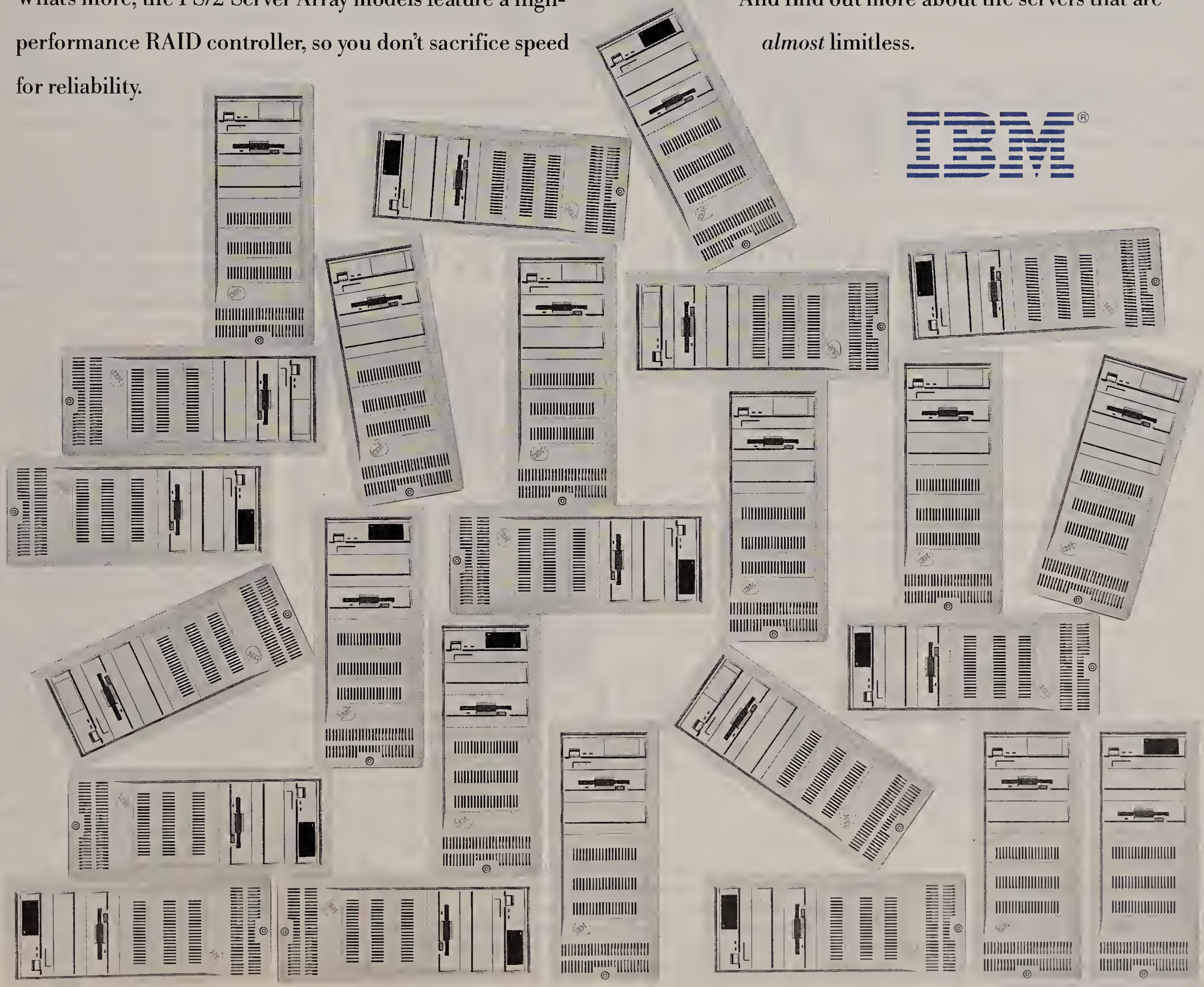

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Object-oriented Cobol to hit streets

By Melinda-Carol Ballou

Is object-oriented Cobol an oxymoron? Not exactly.

While committees are still hammering away to create a standard, Micro Focus, Inc. in Palo Alto, Calif., will make its object-oriented version of Cobol generally available in the first half of next year, industry sources said.

Already shipping in early-release form, the new Micro Focus tool is called Version 1.3. It is offered as an object-oriented option to the company's Cobol Workbench.

The ability to create applications that are accessed via graphical user interfaces (GUI) and to make use of reusable chunks of code — all within the familiar embrace of Cobol — is attractive to corporate developers who maintain billions of lines of Cobol that continue to run key corporate business processes.

"I still will have to teach people to think differently, but the Cobol syntax will be familiar and I can preserve some of my investment in the existing programming staff," said August Hill, a process specialist for information systems at Southwestern Bell Telephone Co. in St. Louis.

Hill said the big concern for his organization will be support across a range of platforms for object-oriented Cobol, which will initially ship on OS/2, DOS and Windows.

"Cobol as it exists has a limited lifespan, and we like the concept of object-oriented because it lends itself better to GUI environments, better maintenance and reuse," said Nason Mills, a programmer at Policy Master PLC, a UK-based software developer for insurance companies that is beta testing the Micro Focus product. "We see it as a way to migrate some of our older programs. But without changing the way you design applications, it won't do anything for you" in terms of gaining object-oriented benefits.

The voice of caution

Some corporate IS developers, however, voiced caution. The full ANSI standard for object-oriented Cobol and IBM compilers that support it on the mainframe, for instance, are not expected until 1995. Although Micro Focus officials said they will offer compatibility with the standard when it emerges, they advised developers to wait to implement production applications.

Bruce Krapf, a senior technical consultant at Cigna Corp., said that while his organization is investigating the technology, it will not make the significant cultural changes involved to endorse it until the standard is set, commitments are clear from the major systems vendors and the language runs on a range of key platforms.

Micro Focus will offer two alternatives: Object-Oriented Cobol and Cobol/SmallTalk. While the former offers object-oriented extentions to Cobol, the latter enables Cobol programmers to make use of SmallTalk as their object-oriented programming language.

Object-Oriented Cobol features

Object-Oriented Cobol includes a programming language; runtime environment; foundation class library; GUI library; integrated development environment; and programmer-definable syntax and functions. This last feature allows programmers to create the syntax for their own programming functions, such as a function for debiting a bank account. These can be more user-friendly than syntaxes that are specified by the programming environment, according to Micro Focus officials and some beta users.

Object-Oriented Cobol will also support IBM's System Object Model and Distributed System Object Model.

Cobol/SmallTalk will include SmallTalk/V PM for OS/2 or SmallTalk/V Win for Windows. These products offer extensions to the SmallTalk/V class library for asynchronous communciations with Cobol. Cobol/SmallTalk also includes a Cobol Copybook for using Common Communication Interface to communicate between Cobol and SmallTalk/V. The company did not release pricing information.

What's in a name?

Desktop vendors on the Object-Oriented Cobol Task Force for the ANSI Cobol Committee considered calling it COOL — Cobol Object-Oriented Language; however, larger, more staid systems vendors objected to that name. They thought that OOCT — Object-Oriented Cobol Transition — would be more appealing to their traditionally conservative user base. But current parlance puts the name at Object-Oriented Cobol.

Artificial intelligence

Expert system keeps UK TV ads in line

By Elizabeth Heichler
LONDON

The largest commercial broadcaster in the UK has found that artificial intelligence is solving a business problem that had grown too complex for humans.

With the help of a Windows-based software package developed using XpertRule from Attar Software Ltd. in Lancashire, England, and marketed in the U.S. by Cincom Systems, Inc. in Cincinnati, the Channel 4 television network is now able to schedule advertising spots more effectively, while redeploying four staff members who previously worked full-time to manually sequence the spots in commercial breaks.

"The software has affected our administration significantly. It's brilliant what it does," said Merlin Inkley, airtime manager at Channel 4's London headquarters. The job XpertRule is doing is "not impossible to do manually, but it's very difficult," he added.

Determining the ads

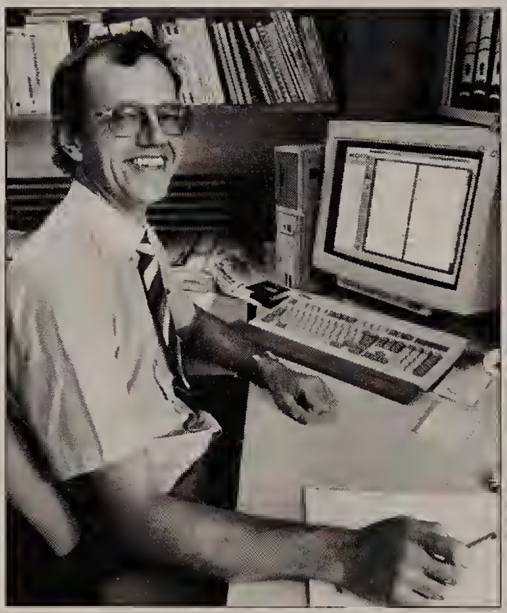
The problem with determining the best order in which to run ads during commercial breaks is complicated by the variety of options available to advertisers. In addition to demanding certain placement in the break, such as first or last in order, advertisers are also able to select among six "macro regions" of the UK into which they would like to transmit their ads.

While Channel 4's programming is broadcast nationwide, the ads shown during commercial breaks vary by region. Advertisers can also choose to have their ads transmitted to "supermacros," or specific combinations of the major regions. A further constraint on scheduling is that an advertisement sold to run in more than one region during a given break must be broadcast simultaneously in all those regions.

Thus, each four-minute commercial break can involve as many as 50 advertisements in various sequences.

"It's a very critical end of the business," said information systems manager Stephen Ottner. "On the sales side, they're trying to make it later and later before they close the books and put everything down to air, and on the transmission side, they're trying to get things earlier and earlier."

Prior to automating the process with the artificial intelligence software, the staff responsible for break sequencing would get a list of all the ads in each commercial break from the transaction processing system, an application written in the PacBasc fourth-generation language environment on a Bull 9000 mainframe. Schedulers would then reorder the spots manually and feed the new list back to the mainframe.



Channel 4's Stephen Ottner: *The complex ad scheduling process is now automated enough for anyone to do*

The Channel 4 software for break sequencing, which has been running on a 486-based PC for about three months, uses genetic algorithm technology. Genetic algorithms literally take a "survival of the fittest" approach to problem-solving by trying different combinations of rules and discarding those that do not make progress against the problem. The application is typically able to sequence a commercial break in about 10 seconds.

Akeel Attar, managing director at Attar Software, said Channel 4's application did not lend itself to a conventional knowledge-based system. "The problem is that while the constraints are known, there are no known strategies," he said. "Decision-making is an area of expertise that can be captured, but with optimization of schedules, experts intuitively work by trial and error."

How XpertRule works

XpertRule's GenAsys genetic algorithm throws random solutions against the hard constraints (or must-haves) and soft constraints (desirables) of the problem and scores them. The software then "mates" those solutions that score well, or crosses them in the computer randomly to create a new solution that is likely to be better. The process goes on for a user-specified number of "generations" until the best acceptable solution has been reached.

Ottner had initially planned to make the automated break sequencing system a batch process once the users had gained confidence in it. However, what has happened in practice is that it is being used interactively, handling the bulk of the sequencing problem, while users in the traffic department then check to see if there is any fine-tuning to be done.

The system has had a big impact on staffing requirements. "Before, [scheduling] was a highly skilled craft; now, anyone with the business skills can do it. Any one of half-dozen people may now be sequencing breaks, but there aren't four people working on it full time," he said.

Ottner added that the system has also cut down on errors.

Heichler is an IDG News Service correspondent in London.

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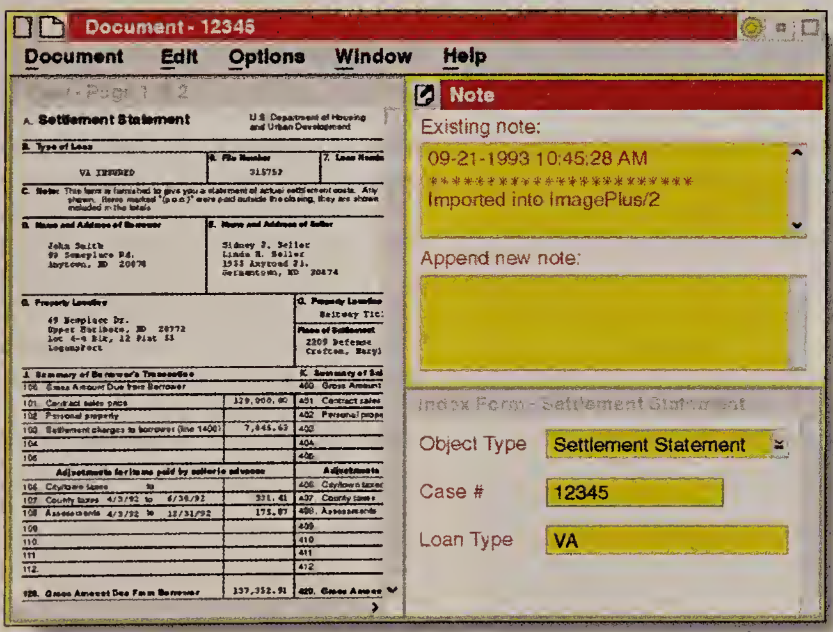

Existing note:

09-21-1993 10:45:28 AM
****
Imported into ImagePlus/2

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Index Form - Settlement Statement

Object Type: Settlement Statement

Case #: 12345

Loan Type: VA

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Loral to buy IBM federal unit

But profitable division carries FAA probe with it

By Mitch Betts
WASHINGTON

Defense contractor Loral Corp. bought its way into the federal systems integration market last week with a $1.6 billion bid for IBM Federal Systems Co. But it also bought itself a giant headache.

Analysts said New York-based Loral paid a premium price for a well-respected, profitable IBM division that has happy customers — with the glaring exception of the Federal Aviation Administration (FAA).

FAA Administrator David R. Hinson, citing cost overruns exceeding $1.2 billion, last week ordered a top-to-bottom independent review of IBM's project to modernize the U.S. air traffic control system. The Advanced Automation System, the cost of which now totals $5.9 billion, is over two years behind schedule (see story below).

Several other customers of the IBM federal division said the Loral acquisition, effective Jan. 1, will have no impact on their operations, mostly because Loral will keep the 11,400-employee division intact and make no major personnel changes.

Robin Rushton, director of child support enforcement systems at the U.S. Department of Health and Human Services, said IBM assured her there would be no change in the people handling the agency's $16 million interstate network.

Likewise, IBM customer Herbert S. Becker, director of information technology services at the Library of Congress, said the acquisition will have no effect on his agency but added, "I think it's a mistake for IBM to sell a profitable part of the company."

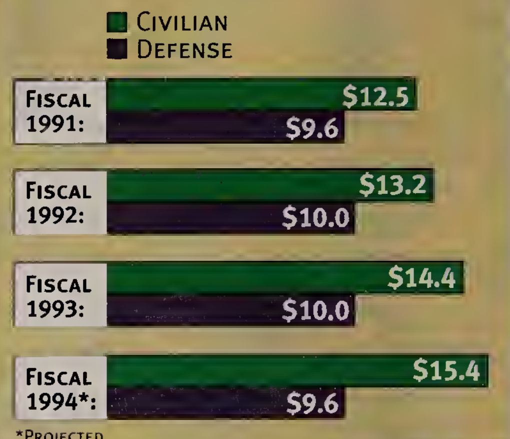
Profit-maker

IBM Federal Systems earned a $71 million profit in 1992, or 3% of its $2.2 billion in revenue; 1993 results are expected to be about the same. Roughly 60% of the division's business comes from defense electronics; the rest comes from systems integration contracts with civilian agencies.

Civilian beats defense

With defense budgets in decline, Loral covets IBM Federal Systems' civilian information technology business

FEDERAL INFORMATION TECHNOLOGY SPENDING ($ BILLIONS)



*PROJECTED

Source: Federal Sources, Inc., Vienna, Va.

Analysts said IBM sold Federal Systems to generate cash for investments in its core businesses [CW, Nov. 15]. At a time when it is fighting the likes of Microsoft Corp., IBM wants to eliminate distractions such as building electronic systems for antisubmarine warfare, said Steve LeCompte, an analyst at International Data Corp.'s IDC Government unit in Falls Church, Va.

Still a player

IBM will still have a presence in the federal government through its Federal Marketing Group, which sells conventional IBM systems and software to federal agencies.

For the acquisitive Loral, the deal provides an escape hatch from declining defense budgets. Although the purchase strengthens Loral's hand in certain defense niches, the real benefit is instant expansion into the civilian agency market for information systems, analysts said.

Robert Dornan, senior vice president of Federal Sources, Inc., a Vienna, Va., federal market consultancy, observed that the sale occurred just as the IBM federal division was piling up a string of contract wins with agencies ranging from the U.S. Army to the Internal Revenue Service.

Traffic jam

IBM's contract to modernize the FAA's air traffic control system has been a constant headache for the firm since the pact was awarded in 1989.

The FAA's decision to reexamine the project in light of $1.2 billion in cost overruns could lead the government to revoke portions of the contract or cancel $2 billion in future options. Cancellation of the main contract is unlikely because that would be costly and disruptive.

Morever, there has been considerable debate about whether the blame lies with IBM, software subcontractor Computer Sciences Corp. or the FAA's midcourse changes in contract requirements, observers said.

The new air traffic control system, which involves more than 2.5 million lines of Ada code, includes the installation of networked RS/6000 workstations that must have no more than one minute of downtime over the next 20 years. Another complicating factor is a new requirement for "continuous operations," which means controllers must be able to use their workstations even when data is being updated.

In a letter to Congress, FAA Administrator David R. Hinson said the newfound cost overruns fall into three categories: costs associated with IBM's effort to "cure" the existing contract; additional software for the continuous operations requirement; and software upgrades that will be necessary after the initial implementation in 1996.

Hinson ordered a two-part review of the program. FAA officials will take 45 days to compile a concise report on the contract's schedule and financial status. In addition, an outside review team will investigate the program and "recommend realistic solutions."

—*Mitch Betts*

Start-up reveals document management plans

A group of former industry executives and engineers from a coterie of Silicon Valley firms last week formally disclosed what they have been working on for the past three years: a client/server document management system.

Documentum, Inc. was founded by former Xerox Corp. Executive Vice President Robert Adams and former chief engineers at Ingres Corp. Howard Shao and John Newton.

The company recently raised $7 million in venture capital — including $3.2 million from Xerox — to bring its total capitalization to $9 million, Documentum said.

Documentum plans to introduce in the first quarter its initial product: a document management server that will run on Unix-based Oracle and Sybase databases. It will support Windows, Motif and Macintosh clients, a spokesman said.

The start-up will compete with document management systems vendors including file management software developers such as Saros Corp. and publishing systems vendors such as Interleaf Corp., according to Mark Walter, a consultant at Seybold Consulting in Media, Pa. Documentum "fills the need for an information management system that is independent of editing applications users have on their desktops," Walter said.

Briefs

Cabletron profits rise

Internetworking vendor **Cabletron Systems, Inc.** posted third-quarter net profits of $31.1 million, a 43% increase from the comparable period last year. Revenue in the period jumped 42% to $156.5 million compared with last year's third quarter, according to the Rochester, N.H., firm.

Iomega expects loss

High-capacity floppy drive maker **Iomega Corp.** expects to post an operating loss for the fourth quarter ended Dec. 31, citing lower than expected revenue and profit margins, combined with higher than expected expenses. The Roy, Utah, company expects to take unspecified write-offs, which could widen the loss.

PC apps continue rise

Sales of PC applications reached $1.65 billion in the fourth quarter, a 16% increase from the comparable period last year, according to **The Software Publishers Association**. A total of $4.71 billion worth of PC applications were sold in the first nine months of this year, up 16.8% from the same period in 1992. Unit sales continued to grow at a 30% pace, but aggressive pricing has cut dollar growth considerably, the Washington organization said.

SHORT TAKES **MapInfo Corp.** in Troy, N.Y., has filed an initial public offering of 1.4 million shares to be priced between $15 and $17 a share. . . . **Norand Corp.** in Cedar Rapids, Iowa, posted first-quarter net profits of $700,000 on revenue of $36.8 million. . . . **Texas Instruments, Inc.** is suing **Cyrix Corp.** for allegedly reneging on an agreement to turn over Intel Corp. x86-class technology. . . . **Reach Corp.** in Sunnyvale, Calif., promoted Chief Operating Officer Kim Peyser to president and COO. Peyser succeeds Anand Jagannathan, who remains chairman.

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Editorial

The 1993 rhyme

'94's just 'round the bend
And as this year comes to an end
Let's review the pits and peaks
Of '93 with tongues in cheeks.

This year's No. 1 emergence:
Computer, cable, phone convergence;
Imagine TV futures yon:
500 channels, nothing on.

Wireless was all the rage,
Computers with a pocket page;
The only problem users see
Is total loss of privacy.

The year for Lotus' Notes was
great,
Now it's hip to replicate;
While Borland launched its
Obex caper
And Microsoft sold mostly vapor.

Though PC price cuts brought out buyers
PC makers froze new hires;
What explains this paradox?
Margins plummeting just like rocks.

Microsoft was most impressed,
Chicago entered Alpha test;
But users know that future days
Will most likely bring more delays.

Storage Tek's Iceberg we hear
Failed again to ship this year;
Wait a minute, hold the phone
Sure this isn't last year's poem?

Initials everywhere you see: OSF and DCE,
ODBC, OS/2 and PCMCIA, whew!
NDM and NMS, SNMP, MIS,
ATM and EDI, SMDS, PCI.

And then there's acronyms you say:
COSE, WABI, DOS, OLE;
Does this madness have no end?
OOPS, I did it there again.

Borland's plan sure got some yucks,
Quattro Pro for 50 bucks;
Foes sneered "Borland's in a crisis"
Then rushed to slash their own list prices.

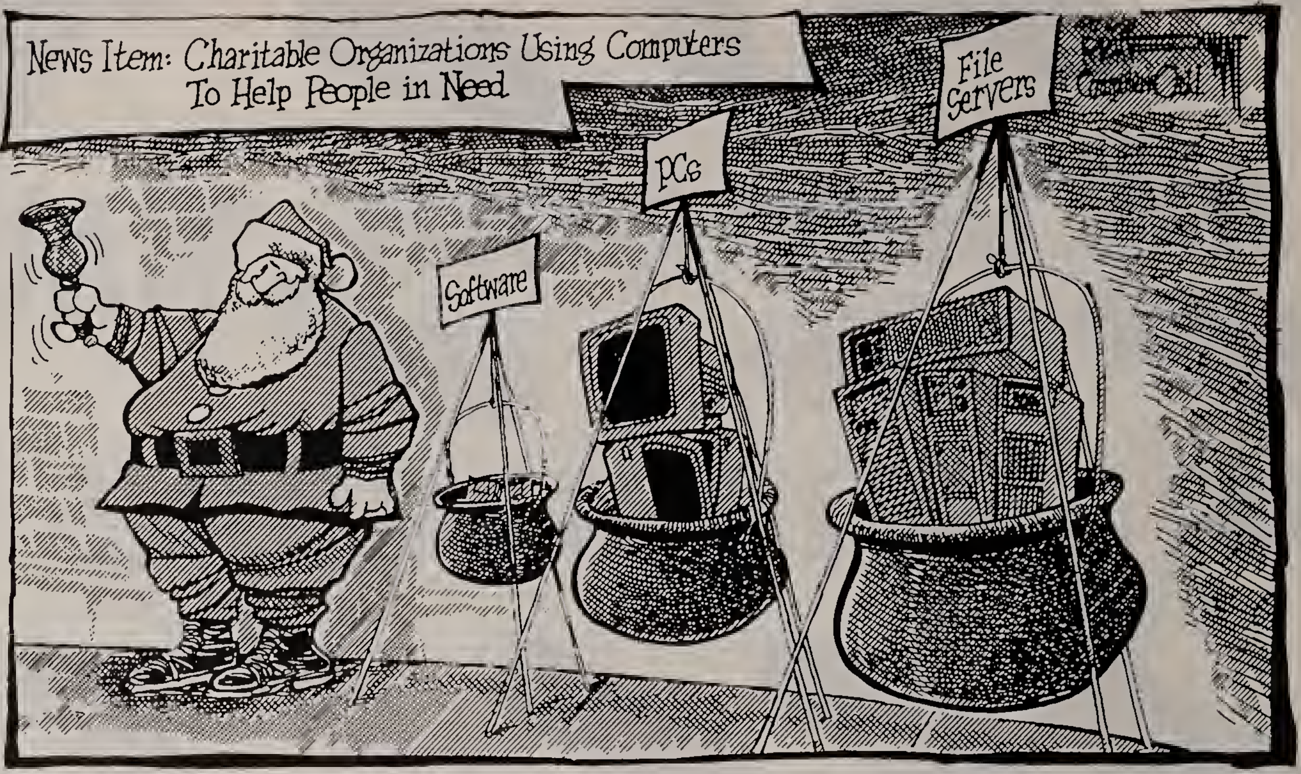
IBM's big mainframe sell
was iron built in parallel.
But users in a muted cheer
Said "Can we get to there from here?"

Got a bug you can't repair?
Hit it with some middleware;
This stuff can unlock data troves,
But how it does it, no one knows.

We hope next year's got more potential,
And good luck rains on you torrential
Just count this blessing if you can
At least you don't live in Japan.

Paul Gillin

Paul Gillin, *Editor*


News Item: Charitable Organizations Using Computers
To Help People in Need
Software
PCs
File Servers

Letters to the editor

Rates not an issue

Mr. Buonincontri's views about offshore programmers in the article "Remedy or ruin" [CW, Nov. 1] is built around some hollow points. Rates charged by foreign consultants should in no way compromise the quality of their work. This is evidenced by the success of companies such as TTA Consultancy Services (TCS) in India.

TCS has successfully provided software solutions for clients all over the world in the past decade. Another highly acclaimed Indian computer company, HCL, has even set up its own consulting firm in the U.S. This can't happen if there isn't quality in the services provided by these foreign firms.

In India we are forced to dig deeper into products such as CICS, DB2, Unix and find indigenous solutions to technical challenges. Many Indian programmers get their training while up against stiff deadlines. Rates charged by offshore consultants appear to be low because of the inflated cost of labor in the U.S., which is seen in many fields.

It is true that many foreign countries that provide software professionals also benefit from financial aid from the U.S. But it is also true that software or hardware sold to foreign countries by U.S. companies carry prices up to 300% higher than in the U.S.

At least part of the aid received by foreign countries flows back into the U.S. as profits to American computer companies.

Balaji Madhavan
Senior software engineer
Complete Business Solutions
Atlanta

Work-flow sights set too high

Regarding "Very little flow in work flow" [CW, Nov. 29], work-flow technology will never fulfill the desire for automation of ad hoc human processes.

This is no knock on work-flow technology, it's just that if you can really, completely, map out a process from start to finish, it isn't ad hoc. Work-flow technology can also give too much credibility to an ad hoc process that shouldn't exist.

Consider a company that invites focus groups to examine its products. It may be possible to speed up this effort using work-flow technology. Yet the whole concept of focus groups may be a bad one for that company. With work-flow technology, all this means is that one gets the wrong answers a lot faster.

Work-flow technology will perform great feats, but it's only a tool. Perhaps the expectations are too high. Without lowering them a bit, the nattering nabobs of negativity will denounce it all as just being a bunch of buzzwords — which we know isn't true at all.

Richard W. Jacobson
Ann Arbor, Mich.

Alive and well

Regarding "In a pickle" [CW, Dec. 6] and your opinion that it is only "... a slight exaggeration to say that open systems are dead." If this is indeed the mind-set of your publication, then *Computerworld* is "in a pickle" and is close to leaving the mainstream.

You think open systems is dead? It has just begun to take off. The largest mainframe company posts multibillion-dollar quarterly losses and you still think mainframes are the future.

Change in this industry is always complex, but the trend is clear to whomever turns to the Dec. 6 Friday Stock Ticker in your journal: Communications and Network Services, up 4.53%; PCs and Workstations, up 0.62%; Large Systems (that's mainframes), off 2.52%

The winner won't be Unix, PCs, Windows, NT or proprietary minicomputers.

The winners will be and are those companies and systems that are able to share, access and use the most of a variety of computer resources.

Dick Heyman
Fort Collins, Colo.

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Hard skills for hard times

Joseph Maglitta

In February 1979, our new systems manager, "Compu-Fred" tromped into our small newspaper office lugging a big carton and announced, "We're computerizing." A phone-chilling wind blew across the room.

"Fred," I pleaded, "I have the technical acumen of a corn dog. Toasters baffle me. Just kill me now and save us both a horde of headaches."

"It's cool," Compu-Fred assured, knifing open the carton with a smile. "You'll learn to love computers."

You've learned the soft skills. You ditched the acronyms and learned to listen. Now try hardball politics.

I didn't believe him, especially the first time a flash of lightning zapped our terminal link with the main office 10 minutes before deadline. As alphanumeric chum marched mockingly across my stunned screen, I silently cursed the entire brotherhood of computer installers.

Call it irony or call it justice, but IS professionals today face what I so cruelly encountered nearly 15 years ago: The Killer Unknown (KU).

The KU, industrial historians would probably tell you, is the big new hoop that faces a profession every 10 or 20 years. Jump through and you get to continue you career. Balk and you walk.

For many, the KU was (and remains) computerdom. For IS today, it's the spectral, dangerous world of politics, leading, partnering and empowering — softball *and* hardball played simultaneously.

Sure, "soft" people prowess — listening, coaching, communicating — remains vital. But the rocky shoals of re-engineering and client/server projects mean that IS must also grow a spiny shell over its soft new interior.

Today's IS survivor/leader must be like a good Chinese dinner: sweet and sour in the same dish, spicy on occasion. Someone who's slick as Willie cutting deals with peers, who can sell and make hell, who can whisper and yell, and who always can answer "What's in it for me?"

I'm no Nostradamus, but I knew the future when I saw it nearly 15 years ago.

Do you see it today?

It's time to update the classic notion of the well-rounded person — the "universal man" of the Renaissance — and transplant it into the conference rooms and tape libraries of IS.

If you're game, hundreds of books and smart consultants are dying to help you cultivate the homey touch of Wendy's Dave Thomas combined with the blood lust of Frank Lorenzo.

My own small contribution is an item I found many years ago in a small-town newspaper. Loosely restated, it went something like this:

"One should be able to write a sonnet, build a house, cradle a child, dig a ditch, cook a dinner, ride a horse, read great literature, chart the stars and serve society with equal ease. Specialization is for insects."

You'll be able to spot folks who don't get the right balance between hardball and softball. They'll be the ones walking around with T-shirts that say: "Ask me about my latest fiasco" or "Fire me first!"

Today I have a PC in my home. I write about computers all day and like it. I read computer magazines, sometimes in bed. Why, my less intelligent friends even call to ask which systems to buy.

So maybe Michelangelo you'll never be. But at the very least, developing into a more rounded person could save you from becoming a square peg.

Thanks, Compu-Fred.

Maglitta is a *Computerworld* senior editor, corporate strategies.

A desktop monster awaits us

John Gantz

There is a line in a poem by William Blake that refers to a beast that "slouches toward Jerusalem." Or maybe it was Bethlehem. Anyway, as poetry, I always thought it was cool, but I never really knew what the line meant. What beast?

I still don't know exactly what Blake was talking about, but I've been thinking about that line recently because I've begun to discern a beast slouching its way toward the IS manager's office.

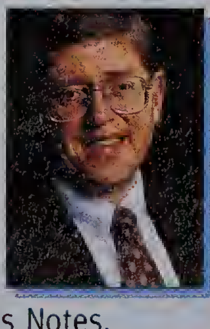
IS executives already have plenty of nightmare material — LANs running mission-critical applications, Cobol programmers who can't seem to learn C++, shrinking budgets, mergers and what not. So what's one more beast bumping around out there?

Plenty. While we're all trying to wrestle client/server architecture and downsizing strategies to the ground, I think we may be missing the threat of another distributed technology under our very noses.

The beast I'm worried about is Lotus Notes and all the follow-ons and knockoffs that will soon appear as so-called mail-enabled applications pass from novelty technology to mainstream technology.

At first glance, the rapid growth of such applications doesn't seem too scary. Mail-enabled applications are usually installed with IS support. IS professionals generally run the networks and have an opportunity to standardize on one or only a few E-mail packages.

But these are first-generation applications. The second generation springs up from the user base, and herein lies the trouble. Notes and other applications that promote information sharing — and intensive data replication — will create unpredictable and unremitting demand for resources.



While you're worrying about client/server and downsizing, there's another beastie sneaking up on you. It's called Lotus Notes.

Users won't put in a chit for a new application that can feed into general capacity planning exercises. They'll just create applications at their desktops. And if one of those applications turns out to be popular, it will blow out the LAN server, hog the router network and make everyone realize they could use a Pentium machine.

What's more, these applications, developing like mushrooms in the dark, will drastically increase the amount of mission-critical data running on remote LANs.

And you won't have any idea which data running on your LANs and enterprise networks is mission-critical and which is not.

Still not worried? OK, think about this. These applications are already starting to grow up department by department in different and incompatible flavors. A few years down the line, when support costs, LAN traffic, database upgrades and Notes programmer salaries are all spiraling out of control, the job mandate for managing and integrating all this stuff will be ceded back to IS, the same way it was with desktop PC applications.

And, trust me, we won't be ready. We won't know how those user applications were developed. We won't have useful documentation, and we won't have compatible systems. We'll only have a job description that says, "Integrate it all." We'll need our own Notes network just to keep track of help desk requirements. We'll be in the belly of that beast.

Gantz is senior vice president of International Data Corp., where he is responsible for all research and consulting in desktop automation and workgroup and office computing.

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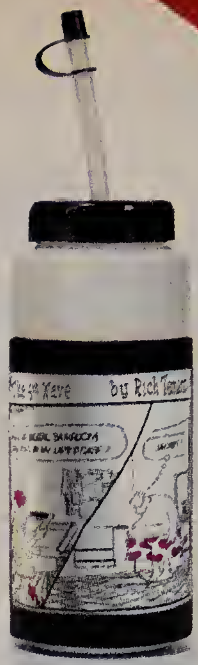

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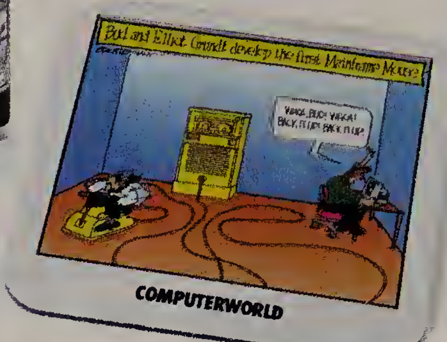

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CA SUPERPROJECT GOES OS/2, 40
NEW PRODUCTS, 44

Multimedia portends notebooks with flair

closer LOOK
Notebooks

By Michael Fitzgerald

Coming soon to an airplane seat near you: near-real episodes of combat, live data feeds and music videos. All in annoying sound and garish color.

These features, which may foster the desire to kill the person in the next seat, will be possible by mid-1994, as analysts and vendors point toward the following solid trends in the high end:

- Multimedia functions becoming widespread, as well as the use of subnotebooks.
- Color taking over as constraints ease, leading to a market that may represent more than half of all systems shipped by year's end.
- PCMCIA add-ons allowing vendors to strip floppies and functions out of notebooks, reducing product size and weight.
- Wireless communications becoming reality, possibly changing the way information flows throughout an organization.

All together now

Bruce Stephen, director of PC hardware pricing and research at International Data Corp. (IDC) in Framingham, Mass., agreed there is a high likelihood that all these factors will come together by mid-year. "The market is moving very quickly" technology-wise, he said.

Of all the forces, however, multimedia appears to be the hottest notebook-related technology, as vendors prepare to tout sound and video as useful business features and not just better ways to play games.

Overall, notebooks should continue to sell at a rapid pace. IDC projects worldwide unit sales of 6.5 million next year, compared with 5.1 million units in 1993, with new categories such as subnotebooks selling roughly 800,000 units. Information systems managers say that as workers do more work on the road and at home, they need to bring their information with them.

IBM's ThinkPad 750C *attaches to its docking station with built-in speakers*

The dizzying rate of technologic change in the notebook market during the past three years should continue. Vendors will play leapfrog in their efforts to lead the market in features and technology.

This means IBM PC Co., last year's unexpected top contender, could follow in the footsteps of Apple Computer, Inc. and AST Research, Inc., previous holders of the "out of nowhere" spot. And that Dell Computer Corp. really could succeed in its attempt to come back to the notebook market.

Picky market for vendors

"I think the market is very fickle," Stephen said. "This year's favored vendor can move out of favor in a short period of time."

Regardless of who achieves most favored vendor status, multimedia will be very important.

Andrew M. Seybold, editor in chief of the Brookdale, Calif., newsletter "Outlook on Professional Computing," said that while "a lot of first-generation multimedia functions are being built into the docking stations rather than the notebooks," sound and video capability and even CD-ROM drives will migrate into notebooks by mid-1994.

The push to add features may stop a price war from occurring in the notebook market. The price war potential inherent in notebooks — the most profitable and fastest growing segment of the PC hardware market — comes from heightened competition, improved availability of color screens that should end major vendors' product shortages and the rapid fall of 486 chip prices under the weight of Pentium. Some speculated that 486SX-based color notebooks could sell for under $2,000 next year.

PCMCIA conundrum

PCMCIA cards will be everywhere in 1994, as vendors stuff different add-in functions on them, including voice recognition. The main problem is managing certain cards, such as modems and hard drives, so they don't totally drain a battery. Some vendors have power management software to turn off the juice to the cards when they are not in use.

Users seem to like trend

Sheldon Laube, national director of information and technology at Price Waterhouse, said, "We're really excited about on-board audio because our training stuff is all going to go through on-board delivery, and if you can combine both text and audio you get a much better retention rate than text alone." He added

Notebooks, *page 44*

Borland makes importing, exporting a breeze with Obex

Exchanging files between Quattro Pro for Windows, DOS and Paradox easy

PRODUCT test DRIVE

- Paradox for Windows
- Quattro Pro for Windows
- Quattro Pro for DOS

By Elaine DeJoy

Have you ever contemplated taking a file from one program and exporting or importing it to another program? No? Here's a good reason to reconsider.

Borland International, Inc.'s products — Paradox for Windows, Quattro Pro for Windows and Quattro Pro for DOS — have made exporting and importing files a breeze using the Borland Object Exchange (Obex) facility.

Obex is essentially a set of Dynamic Data Exchange protocols wrapped in an object interface that allows a file to be directly inserted into another file format.

Easier for users and directors

For information systems directors, the promise of Obex is that it will allow users to query databases and import that data into their spreadsheets without assistance from the IS director.

A place in Paradox

System requirements:

- An Intel Corp. 80386 or higher CPU.
- At least 20M bytes of free disk space (the Paradox system files alone take up 15M bytes).
- EGA or higher (CGA video cards are not supported).
- Windows 3.1 or higher (Version 3.0 is not supported).
- A mouse is strongly recommended. Some design features cannot be accessed without a mouse.

For instance, you can take a database or table created in Paradox and make it into a spreadsheet file with just a few clicks on the mouse, without reentering any data.

To accomplish this, a user needs only to invoke the File/Retrieve command in Quattro Pro and enter the drive, directory, path, filename and extension at the File Name dialog box — for example, d:\pdoxwin.\working.\test.db.

Believe it or not, Quattro Pro grabs that Paradox file and converts it to a Quattro Pro file. Not only will the data be intact, but if the Paradox file contained any large field lengths — say, 15 or 25 characters — Quattro Pro will keep that field length the same.

Quattro Pro to Paradox

Conversely, you can import a file from Quattro Pro for Windows into Paradox. From Quattro Pro, use the File/Save As command and save the file with a ".db" extension (used for Paradox files). Answer a few more questions prompted by Quattro Pro, and then go out and use the file in Paradox: Use the File/Open/Table command and select the file you imported, and you will have that file in a Paradox table form. Again, the process is simple, and the same procedure can be performed using Quattro Pro for DOS and Paradox.

There are other ways to export and import the files by using Paradox's File/Utilities Export/Import commands, but they involve more clicks of the mouse.

In summary, the tests conducted to export and import files from the above programs worked admirably. But if you run into a problem and try to contact Borland's Technical Support group, be prepared for a wait to speak with someone. In fact, you may be better off consulting the user guides provided with the software, since waiting for someone to answer your support call can easily require 30 minutes.

Tips

You might run into problems performing a Paradox import from Quattro Pro for DOS. Quattro Pro for DOS was released on Aug. 20 and Paradox was released on Sept. 18. The problem is that Quattro Pro for DOS stores a created notebook (or file) in a ".wq2" extension, which Paradox will not accept.

But there is a solution. When a notebook (or file) is created in Quattro Pro for DOS, use the File/Save As feature and then type the file name, but make sure you type a ".wq1" extension at the end.

DeJoy is a free-lance writer based in South Kingstown, R.I.

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Project management

CA-SuperProject goes OS/2

By Thomas Hoffman

Computer Associates International, Inc.'s second major application for OS/2 has sparked a favorable stir among early users seeking multitasking capabilities in project management.

CA's recent delivery of CA-SuperProject for OS/2 comes on the heels of the company's November release of CA-Realizer for Windows and OS/2, a Basic graphical user interface development environment.

Early CA-SuperProject for OS/2 beta testers described the product as a functionally rich suite that delivers on project management requirements such as multitasking and file sharing. This is particularly important because the DOS and Windows-based versions of the product were not as functionally complete as the OS/2-based package is.

"I was happy to see that CA was coming out with an OS/2 version," said Greg Schmidt, project manager for wide-area network implementation at MCI Communications Corp. in Colorado Springs. While SuperProject is running under OS/2, "you can do other things," such as multitasking, Schmidt added. "With Windows, you're kind of limited."

Multitasking functionality

Schmidt said one MCI unit used CA-SuperProject for Windows for several months, but because Schmidt's group manages MCI's WAN projects across the U.S., it required the OS/2 package's multitasking functionality. Schmidt's group has been using the OS/2 package for several months.

CA-SuperProject for OS/2 is bundled with the Windows version for $649 — a 27% price reduction from the original $895 cost of the stand-alone Windows version. Users of other CA-SuperProject packages and competitive products can upgrade to the OS/2 version for $149. The package also includes the Timesheet Professional for Windows module, a time card and expense system.

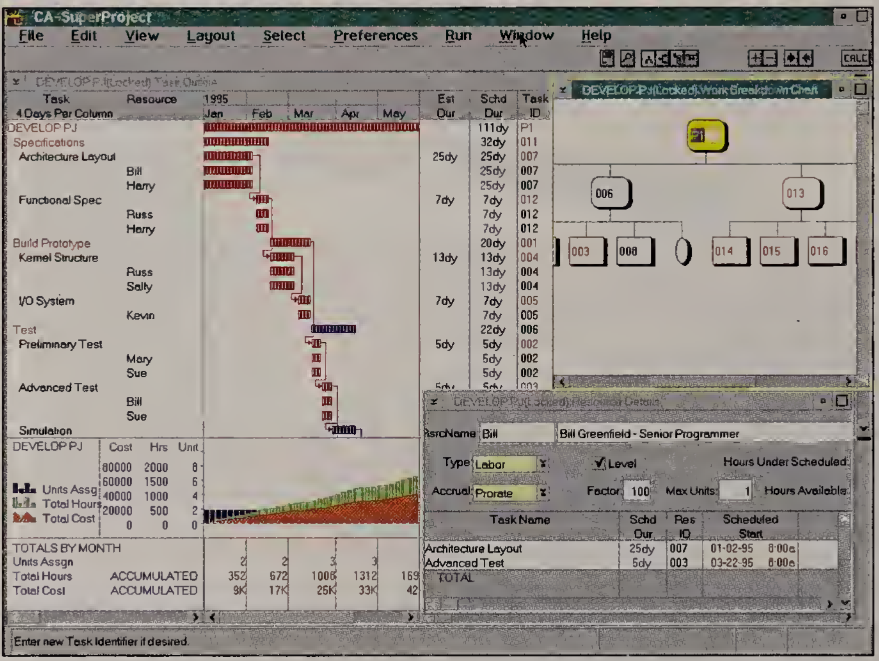
In addition to its multitasking capabilities, the native 32-bit OS/2 product also exploits drag-and-drop features in the OS/2 WorkPlace Shell. Plus, CA-SuperProject files are now binary-compatible across four platforms — OS/2, Windows, DOS and Digital Equipment Corp.'s VAX/VMS — so a project file saved on one environment can be directly opened on another. All project team members can work on the same project, even when logged on to different hardware platforms.

Georgianna Hall, a business analyst at Washington Gas Light Co., a natural gas utility serving the greater Washington area, considered and tested Applied Business Technology Corp.'s (ABT) Project Workbench package running Windows before settling on CA's Windows-based SuperProject in the summer of 1992. Hall said the Windows-based ABT package offered a fairly narrow range of capabilities and did not perform well on OS/2.

The utility began testing CA-SuperProject for OS/2 in March. Hall said she and her associates, who are linked together over a Novell, Inc. NetWare LAN, have ordered 12 copies of the software.

Amy D. Wohl, president of Wohl Associates, a Bala Cynwyd, Pa. consultancy, said CA is positioning CA-SuperProject for OS/2 on the high end of the project management PC software market for enterprisewide use.

The package can handle more tasks simultaneously than Windows-based products such as ABT's Project Workbench or Microsoft Corp.'s Project, she said.



Task	Resource	Est Dur	Schd Dur	Task ID
DEVELOP PJ			111dy	P1
Specifications			32dy	011
Architecture Layout		25dy	25dy	007
	Bill		25dy	007
	Harry		25dy	007
Functional Spec		7dy	7dy	012
	Russ		7dy	012
	Harry		7dy	012
Build Prototype			20dy	001
Kernel Structure		13dy	13dy	004
	Russ		13dy	004
	Sally		13dy	004
I/O System		7dy	7dy	005
	Kevin		7dy	005
Test			22dy	006
Preliminary Test		5dy	5dy	002
	Mary		5dy	002
	Sue		5dy	002
Advanced Test				
	Bill			
	Sue			
Simulation				

TOTALS BY MONTH						
Units Assgn		2	2	3	3	
Total Hours	ACCUMULATED	352	672	1008	1312	169
Total Cost	ACCUMULATED	9K	17K	25K	33K	42

RsrcName: Bill — Bill Greenfield - Senior Programmer

Type: Labor ☑ Level

Accrual: Prorate Factor: 100 Max Units: 1

Task Name	Schd Dur	Res ID	Scheduled Start
Architecture Layout	25dy	007	01-02-95 8:00a
Advanced Test	5dy	003	03-22-95 8:00a
TOTAL			

Enter new Task Identifier if desired.

CA-SuperProject for OS/2 *can handle up to 64,000 simultaneous tasks, or twice as many as the Windows version.*

Beta in the works

CA is planning to deliver a beta version of CA-SuperProject for Sun Microsystems Computer Corp.'s Solaris Unix environment in mid-January, followed shortly thereafter by a Microsoft Corp. Windows NT beta version of the project management package, according to Marc Sokol, CA's vice president of product strategy.

Board Watch

Christopher Lindquist

Upgrades, patches and general buzz

Keep an eye on your hardware and software vendors. They all claim to be working for you, but they know where the real market opportunity is — your TV set.

Yep, they all want to be the brains in the controller box governing the one-eyed bandit in our living rooms. Microsoft, Silicon Graphics, Hewlett-Packard, AT&T, Lotus — all the big ones — have at least one hand occupied keeping track of the latest plans for household data delivery.

Of course, they're also thinking about some new offerings because the proposed data superhighway will have more to do with fun-on-order and selling cubic zirconia than with pumping your accounting files around. That means fewer research and development dollars for the products you care about. Just something to keep in mind for the year 2000.

Tracking MS-DOS

An even more immediate concern for some of you is the MS-DOS 6.2 upgrade, or "StepUp." While a few users are reporting problems with 6.2, it appears to be much more stable than its not-so-honorable ancestor, MS-DOS 6.0. The biggest issue for some potential customers has been an inability to find the upgrade at all. If you're in the same boat, you can find it available for download on CompuServe's MS-DOS forum or through anonymous File Transfer Protocol at ftp.microsoft.com, listed as stepup.exe in the \peropsys\msdos\msdos6.2 directory.

Oh, and if you're running Stacker 3.1 while trying to install 6.2, be sure to check the time stamps on the Stacker files. If you see 3:10a on files created June 6, 1993, you're OK. If they have later dates and times, you'll need a patch from Stac before beginning. The patch can be downloaded from the Stac forum on CompuServe. Microsoft says it tested 6.2 using the earlier version of Stacker 3.1, then Stac changed the files without notice, resulting in compatibility problems.

Intellectual property

Also on the Microsoft front, a couple of Usenet users were wondering whether Redmond got its money's worth from its rather robust legal staff. The general consensus was, yes, they probably earned their keep, and as one user put it, "The only real question is whether Apple's lawyers will sue 'Mickeysoft' lawyers for stealing the 'look and feel' of their suit to use against Sun."

Interbase resurfaces

Borland is attracting some attention (or trying to, at least). It's finally finished polishing Ashton-Tate's "family jewel," the Interbase engine, and is calling for volunteers to try out the latest version of the database server. Interbase, as you may recall, was the much-hyped product Ashton-Tate purchased shortly before going belly-up. At the time, users said Interbase had a technology lead on several major database vendors, but many moons have passed and competing technology has improved. We'll see if Borland has what it takes to wow the masses.

Oh, and if you're interested in testing Interbase, call (408) 431-1000 to order an on-disk InterBase Tester Application.

Borland's also getting some attention for recently slipped Borland C++ 4.0 ship dates. If the Scotts Valley crew is lucky, the much-awaited compiler will be on store shelves by the time you read this. If not, expect to hear the groans of some mighty cranky coders. One CompuServe user even noted that he saw a December demo of Borland C++ that was done with Version 3.1. That sure didn't raise his confidence about seeing 4.0 anytime soon.

Wishful thinking?

The PowerPC forum on the Internet is sure taking some hot traffic these days. Everyone has an opinion on whether the PowerPC is really the Intel/Sun/Alpha/Mips-killer it's supposed to be. Unfortunately, almost all the opinions are based on other opinions, and until someone comes up with some facts (and some hardware), the PowerPC is just more pie in the sky. I don't care how many PowerPC machines IBM had in its booth at Comdex.

Sources of infection

This report just in from the virus front: A Usenet poll of virus-afflicted readers turned up Michelangelo, Stoned and 512 as the three most prevalent viruses.

Lindquist is technical editor at *Electronic Entertainment* magazine. He can be reached electronically over MCI Mail at clindquist, CompuServe at 73361,263 or the Internet at chrisl@netcom.com.

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The new ProLinea Net1 features a sleek design

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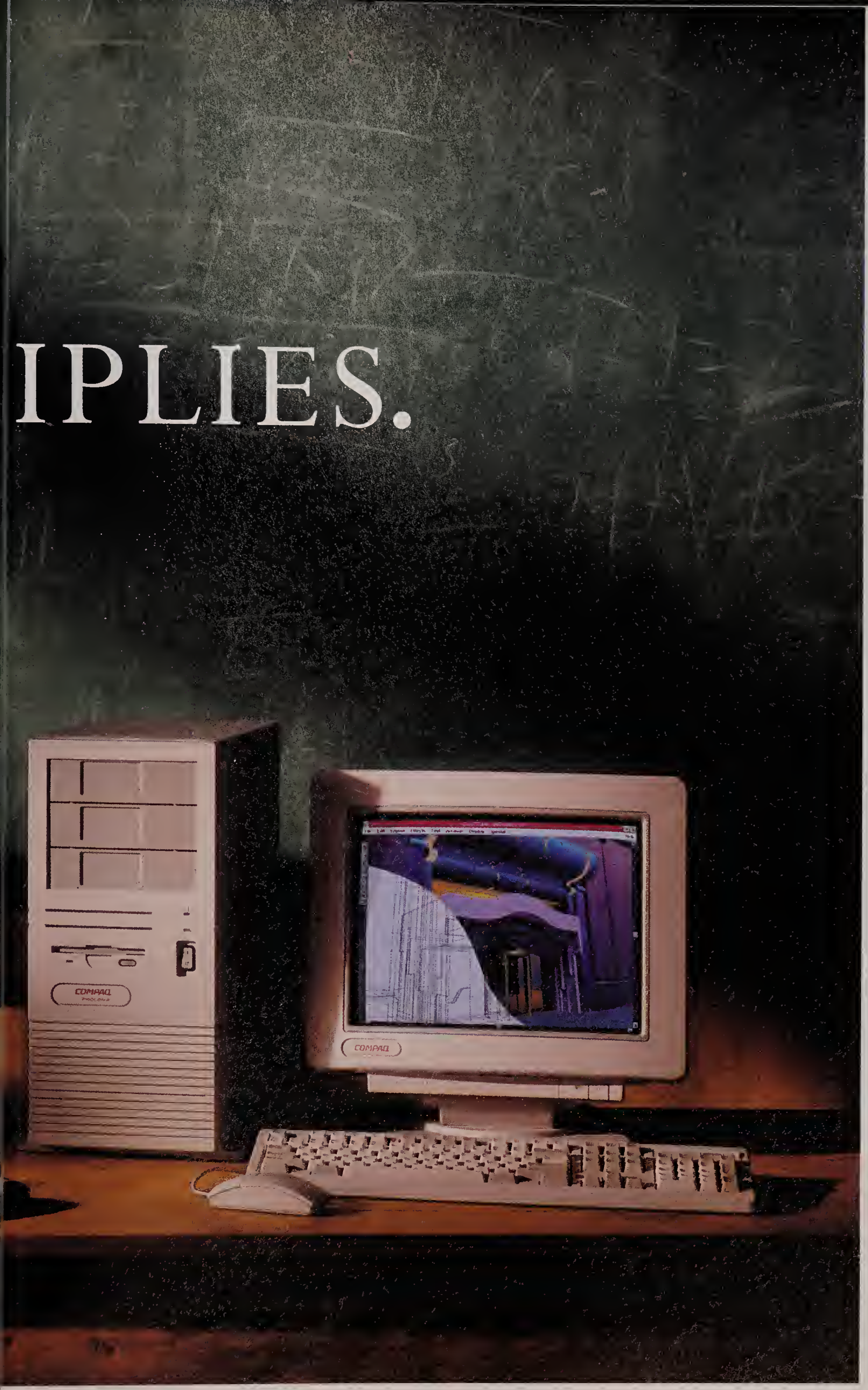


with an integrated monitor. But despite the extremely small footprint, it's anything but meek.

For starters, there's an integrated network interface for either Ethernet or Token Ring environments. And it comes with a 486SX/25 processor and includes an extra-sharp 14" SVGA display.

The new ProLinea MT, on the other hand, features a mini-tower design with five slots and five bays. It includes Local Bus Graphics and is available in three processors, from 486SX/33 to 486DX2/66, and all are upgradeable to Pentium technology.

While each ProLinea is unique, they all share features in common. Every ProLinea is already loaded with MS-DOS 6 and MS Windows. And each also includes TabWorks, a new software interface available only from Compaq that makes using Windows even easier. (And you more productive.)

Of course, no matter how many different models we make, each one has to be aggressively priced to continue the ProLinea tradition. That's why the ProLinea Net1 starts at just $1,099, the mini-tower at $1,449, and multimedia models at just $1,549.* All of which is good math no matter how you calculate it. For complete details, just call 1-800-345-1518. COMPAQ

Notebooks

CONTINUED FROM PAGE 37

that "dual-scan [passive-matrix color] has gotten good enough, so we buy mostly color."

Laube said while dual-scan color screens are slower than thin film transistor (TFT) active-matrix color, they are significantly less pricey.

Price Waterhouse consultants sidestep the performance issue by connecting their notebooks to display devices when making presentations.

Presentations are a key use for notebooks, and other users said TFT color was the only acceptable way to make on-screen graphics presentable. "Most [of our] agents will use the notebook sometime during the sale, and with passive matrix you can't really see" the presentation, said Victor Mutnick, corporate vice president at New York Life Insurance Co.

The market's other major focus next year will be communications, particularly wireless communications. Wireless has become something of a grail, given its potential to allow users access to information despite uncooperative hotel phone systems, digital office telephone networks or no phone at all.

Still, some IS managers are simply looking to upgrade from 2.4K bit/sec. modems to something faster. "We feel cellular is too expensive. Our folks still don't do that much communicating from the client's office," Mutnick said.

New York Life will probably move to 9.6K bit/sec. modems next year, he said.

Color screen shortage here to stay

Technology has its drawbacks, as users slavering at the thought of notebooks with active-matrix color screens discovered this year. The screens were simply too hard to make in the volumes the market desired, resulting in shortages that even vendors acknowledged were unacceptable.

Major vendors such as Compaq Computer Corp., IBM PC Co. and Toshiba America Information Systems, Inc. stopped predicting when they might be able to deliver products this year, though users with pull were often able to get their orders well before expected.

While smaller vendors, particularly NEC Technologies, Inc. — which makes its own displays — were able to meet their demand, users interested in thin film transistor (TFT) active-matrix screens have been sadly disappointed by virtually every large vendor.

However, some relief is in sight, analysts and vendors said. Constraints are expected to last through the first half of next year, but Sharp Corp. and NEC are ramping up production. Display Technologies, Inc., the IBM/Toshiba joint venture, expects to nearly double production next year, and manufacturers such as Seiko-Epson Corp. have hit the market with flat panels. But shortages will last until 1995, as demand for color skyrockets.

An intriguing alternative to TFT is active addressing, which purports to combine the low costs of passive-matrix screens with the performance of active-matrix ones. Active addressing is pushed by a Motif, Inc., a Motorola, Inc. and In-Focus Systems, Inc. joint venture. Motif has told analysts it will have 9.6-in. and 10.4-in. versions of its displays available next year, which could take some market share away from TFT displays.

—Michael Fitzgerald

COLOR NOTEBOOKS

PROJECTED 1994 U.S. NOTEBOOK SHIPMENTS

BREAKDOWN BY SCREEN TYPE

ACTIVE-MATRIX COLOR SCREEN:
671,000

PASSIVE-MATRIX COLOR SCREEN:
716,000

MONOCHROME SCREEN:
1.6 million

TOTAL NOTEBOOK MARKET:
2.99 million

Source: International Data Corp., Framingham, Mass.

Pentiums: Eating up power

Hot-running Pentium provides a variety of challenges that could leave notebook makers eating desktop dust for all of 1994.

Although some vendors plan Pentium-based notebooks, the lack of 32-bit software, certain architectural components and the like will make it difficult for vendors to put a full-fledged Pentium system on the market next year.

Manufacturers say they can build Pentium notebooks despite the chip's thermal issues and tendency to drain power like some sort of superscalar vampire. But some say the notebooks will take little advantage of Pentium, so many manufacturers say they will wait.

Others will forge ahead. Taiwanese manufacturers such as Twinhead International, Inc. and Clevo Corp. plan to introduce notebooks based on Pentium in the first half of next year, though these will lack features such as a Peripheral Component Interconnect bus, an integral part of most optimized Pentium systems.

Heat wave

Pentium's thermal issues are not insignificant, either, and Intel has promised a 3.3V version of Pentium for the second half of the year. But conventional wisdom says Pentium notebooks will not appear in any volume until the first quarter of 1995.

Pentium heat issues may even lead notebook makers to implement the PowerPC 603, a low-volt chip out of the IBM/Apple Computer, Inc./Motorola, Inc. venture that runs much cooler than Pentium does.

Battery life will be improved by 3.3V technology, but there may still be thermal issues even then. Accordingly, companies such as Aavid Engineering, Inc., a Laconia, N.H., maker of heat sinks, are applying technologies tested out in mainframes to cool off Pentium.

Aavid is essentially bringing the idea of liquid cooling to the notebook realm with Oasis, a fluid-cooling technology that puts a packet filled with 3M Corp.'s Fluorinert cooling liquid on top of the chip and dissipates heat by piping it out to the display.

—Michael Fitzgerald

New Products

Direct Technology Ltd. has announced a Windows Edition of Automater QA, its automated software testing tool.

According to the New York company, Automater QA Windows Edition features extensive reporting and analysis of test results, intelligent screen recognition, bit-map checking, an intelligent identity facility and automatic checking of Windows objects such as dialogs or menus.

Development packs cost $7,495 and runtime versions are priced at $1,250. Volume discounts are available.

▶ *Direct Technology*
(212) 475-2747

Caere Corp. has introduced OmniPage Professional 5.0 and OmniPage 5.0, optical character recognition (OCR) software.

According to the Los Gatos, Calif., company, OmniPage Professional 5.0 uses its three-dimensional OCR for accuracy over a broad range of business documents. It offers true WYSIWYG formatting for complex documents with True Page processing.

Full 24-bit color image-editing capabilities are integrated with True Page for capturing and editing graphics and text.

OmniPage Professional 5.0 is a full-featured OCR package. OmniPage 5.0 is a full-featured text product for mainstream office documents.

OmniPage Professional 5.0 costs $695; OmniPage 5.0 is priced at $495.

▶ *Caere*
(408) 395-7000

Global Training Technologies, Inc. and **Lotus Development Corp.** have announced the availability of Global Training's End User Basics Computer Based Training Module for Lotus Notes Release 3, computer-based training lessons that teach the fundamentals of Notes.

According to Global Training Technologies in Santa Monica, Calif., each lesson comprises instructional text, color graphics, interactive exercises and review questions. End User Basics consists of seven chapters and includes a Navigational Course Map and a Notes Skills Assessment Test.

End User Basics costs $295 per single-user license.

▶ *Global Training Technologies*
(310) 587-3300

Binar Graphics, Inc. has introduced SkyScraper, a desktop manager designed for OS/2.

According to the San Rafael, Calif., company, SkyScraper offers a visual representation of the multitasking capabilities of OS/2.

Users can run numerous applications simultaneously, with each one maximized, and switch from one application to another with a single click.

SkyScraper's tool bar is configurable and the product provides an "Arrange Applications" feature.

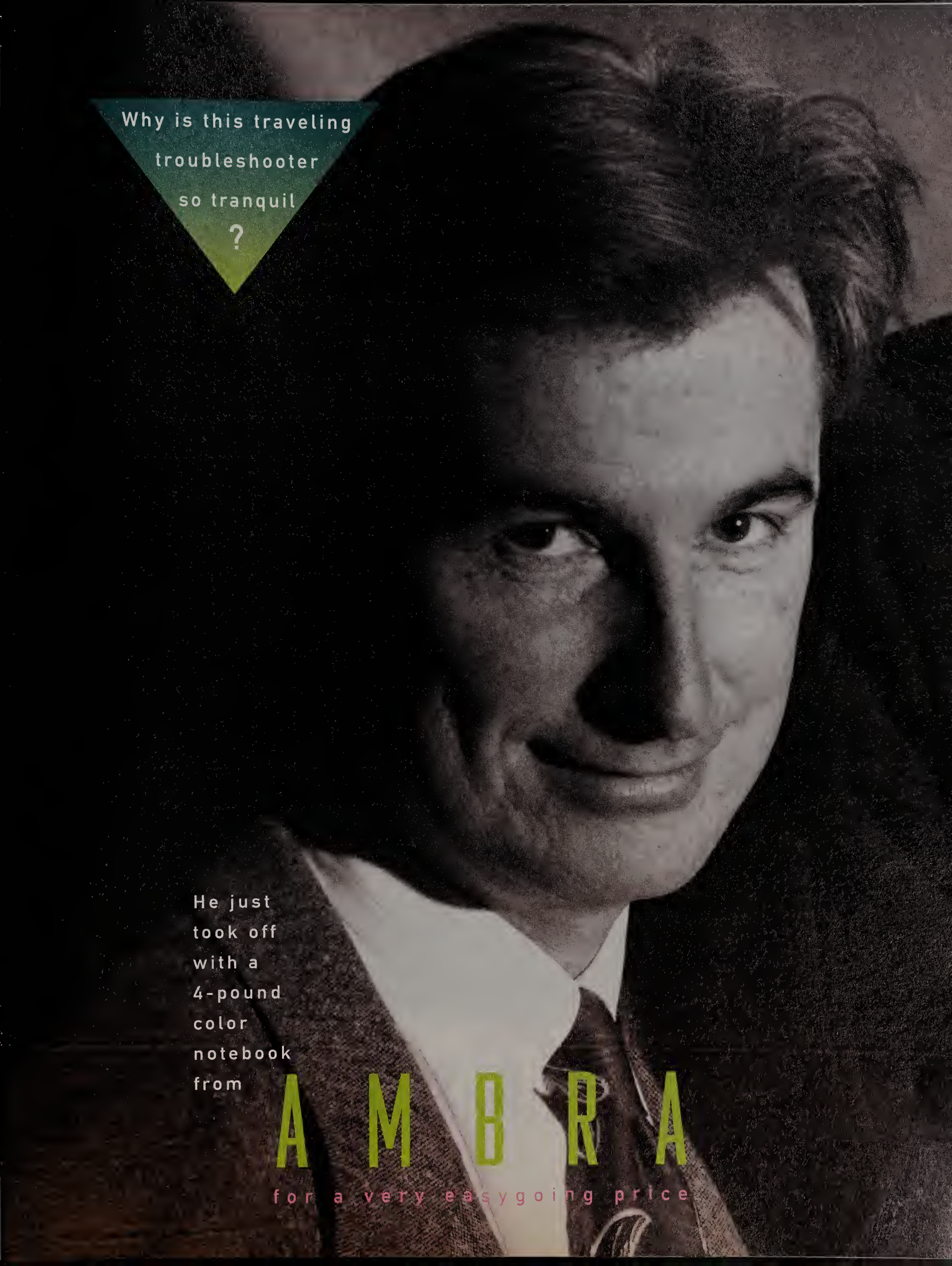
SkyScraper system requirements include OS/2 2.0 or higher, 386SX or above, 200K bytes of hard disk space and 4M bytes of RAM or more.

SkyScraper costs $99.

▶ *Binar Graphics*
(415) 491-1565

Product shorts

Kalock Corp. has introduced a 540M-byte removable disk drive. It features an access time of 11 msec and offers transfer rates of up to 8.3M byte/sec., error-correction code on-the-fly and 4,200 rpm. Cost: $950 for a package that includes the K-STOR II dual docking module, software, controller, carrying case and installation guide. Kalock, Sunnyvale, Calif. (408) 747-1315. . . . **American Business Software, Inc.** has introduced No-Problem, a data/data file retrieval program that protects the user against data loss on the hard disk or in RAM. In the event of a software crash or power failure, the product reconstructs and replays on-screen the input up to the point of failure, except for the last keystroke. Cost: $99. American Business Software, Orange City, Fla. (904) 775-7692.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Lotus Organizer - [Untitled]
File Edit Section Page Tools Options Help
Planner 1993
AMBRA

$1,899

SN-Series

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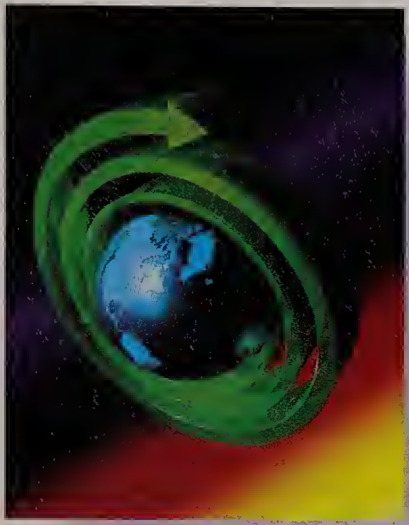

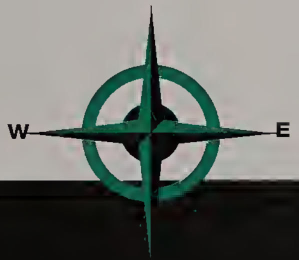

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Hot color

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PC Computing calls **active matrix color** "beautiful to behold."[1] One glance at the uniformly brilliant, fast-refresh, glare-free **TFT** screen of our premium notebook, and you're sure to agree!

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With new high-speed, high-performance AMBRA notebooks, no application is too demanding. You have the power to do it all! At **6.6 pounds**, these machines are as trim as they are fast — **33 or 50 MHz.** Besides **486SX or DX2** processing clout, they come with a full array of desktop-level features, and **high-volume hard disk capacity.**

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Work steadily through a "stop and start" day! AMBRA SN-Series notebooks let you easily halt mid-application, and later pick up in the same place.

Comfortable keyboards, fingertip mouse function.

Some notebook keyboards feel cramped and shallow, with pointing devices that are unwieldy or easily lost. Not ours. Here's why:

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- Integrated 16mm trackball

16mm trackball

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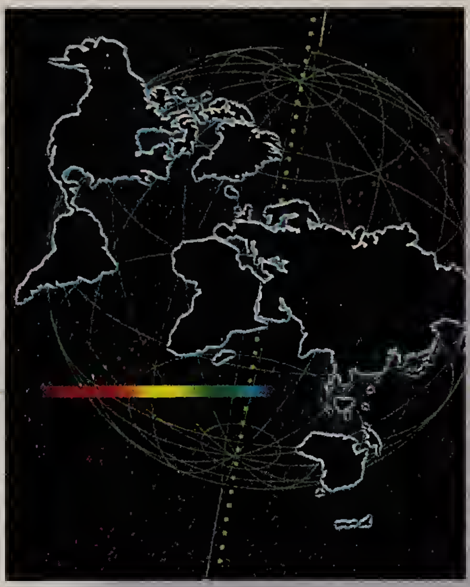

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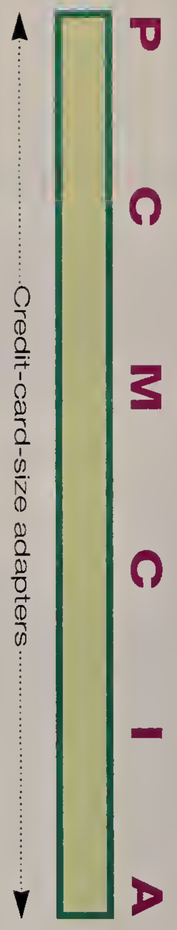

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"TRAVELER" OPTION BUNDLE: $288

For N-Series: Includes PCMCIA 2.4/9.6 kbps fax/modem and extra battery

"INSTANT OFFICE" OPTION BUNDLE: $927

For N-Series: Includes docking station, 15" FST color monitor, full-size keyboard

"QUICK DOCK" OPTION BUNDLE: $417

For SN-Series: Includes port replicator, 14" UVGA color monitor, full-size keyboard

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With an optional docking station, your AMBRA mobile system can be instantly plugged into extra storage, extra peripherals, networks and resources throughout your company!

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2 drive bays (5.25" and 3.5")
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2 serial ports
1 parallel port
1 video port
1 keyboard port
$499

SN-Series Docking Station
2 ISA slots
2 serial ports
1 parallel port
1 video port
1 keyboard port
$249

SN-Series Port Replicator
2 serial ports
1 parallel port
1 video port
1 keyboard port
$89

NOTEBOOKS

LIGHTWEIGHT NOTEBOOKS

N-Series

N450T

- 486DX2, 50 MHz
- 8MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" TFT active matrix color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- MS-DOS,® Windows™ 3.1
- Carrying case
- 6.6 lbs, including battery

$3,999

N450C

- 486DX2, 50 MHz
- 4MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 200MB hard disk
- 9.5" STN dual-scan color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

$2,699

N433C

- 486SX, 33 MHz
- 4MB RAM, max: 12MB
- 3.5" 1.44MB diskette drive
- 120MB hard disk
- 9.5" STN dual-scan color screen
- 1 PCMCIA slot, Type III
- Integrated 16mm trackball
- MS-DOS, Windows 3.1
- Carrying case
- 6.6 lbs, including battery

$2,299

SN-Series

SN425C

- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM, max: 20MB
- 170MB removable hard disk
- 7.8" STN color screen
- 1 PCMCIA slot, Type II
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

$1,899

(With external 3.5" 1.44MB diskette drive, add $99.)

SN425

- 486SX, 25 MHz, SL-Enhanced
- 4MB RAM, max: 20MB
- 80MB removable hard disk
- 8.2" monochrome LCD
- 1 PCMCIA slot, Type II
- Integrated 16mm trackball
- Suspend/Resume
- MS-DOS, Windows 3.1
- Slip case
- 4 lbs, including battery

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[1] Ron White, "In Search of the Ultimate Notebook," *PC Computing*, July 1993. [2] Please call for details regarding AMBRA's money-back guarantee, limited warranty and Executive warranty. Return shipping and insurance charges are the responsibility of the customer. [3] Offerings may differ in Canada.

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Vendor group unveils turnkey platform, 52
New products, 52

Unix systems help predict weather

National Weather Service plans for 115 sites by mid-1996

By Jean S. Bozman

Unix workstations will play a leading role in the National Weather Service's rollout of enhanced forecasting systems at 115 sites nationwide. The Midwest, hard-hit by river flooding last summer, will be one of the first areas to install the workstations.

The systems, Hewlett-Packard Co. HP 9000 Model 750s, will add simulation and visualization to mainframe-based systems that output data on printer paper. The nationwide rollout will place networks of eight to 10 Unix workstations in forecasting offices by mid-1996. Each workstation can support X Window System terminal users.

The project is part of a $227 million contract won by PRC, Inc. in McLean, Va., to deliver the Advanced Weather Interactive Processing System (AWIPS) as part of a nationwide $4 billion overhaul of the weather service's computer systems.

An AWIPS prototype *is used as a demonstration system at the Denver National Weather Service Forecast Office*

AWIPS will automate manual systems that force forecasters to combine data from radar screens, mainframes and clipboards. Weather forecasters will use terminals to access a set of Hitachi Data Systems Corp. mainframes in Suitland, Md., running IBM's VM operating system, which will stay in place. Some forecasting offices still use older Data General Corp. and Prime Computer, Inc. minicomputers, said Richard Farnsworth, deputy chief of the Hydrologic Research Lab in Silver Spring, Md. But graphical output is limited, and much of the data appears as rows of numbers from long paper printouts.

The graphical Unix workstations will be able to run simulations of weather patterns and to forecast data in a more timely and accurate way, said Mike Hudlow, director of the weather service's Office of Hydrology. "The coverage will be better with higher resolution of the data," Hudlow said, "and there will be the capability to interact with the [weather] models."

Once the workstations are installed, forecasters will be able to view data from the 113 Nexrad advanced radar storm-monitoring systems that the weather service is installing across the U.S. [CW, Jan. 11]. Forecasters will also be able to view satellite data broadcast from National Weather Service headquarters.

Forecasting accuracy

The Unix systems will exchange data with one another — and with systems from other federal agencies, such as the U.S. Geological Survey, Hudlow said. The plan is to pair each National Weather Service forecasting center with a Nexrad site, weather service executives said. Before, data from less accurate radar systems was fed into forecasting models. Once in place, the new systems will electronically receive Nexrad data, which is estimated to be 60% to 80% more accurate than older radar sources.

Because of recent river flooding, the Kansas City, Mo., and Minneapolis offices will use "advanced development" versions of the Unix system to monitor the Mississippi and Missouri riv-

Unix systems, *page 52*

ON SITE

National Weather Service
Silver Spring, Md.

Challenge: To update 20-year-old forecasting systems with a network of Unix workstation systems.

Technology: Hewlett-Packard's HP 9000 Model 750 workstations, Unix applications written in C, a Motif user interface and a packet-switched wide-area network to link LANs in local forecasting offices.

Results: More timely and accurate forecasts of storms and floods, high-resolution graphics and reduction of manual work through electronic input of data.

Product strategies

Acer revamps its server line

By Stephen P. Klett Jr.

Acer America Corp. breathed new life into its server strategy last week, rolling out three servers — including a high-end symmetric multiprocessing machine designed to run Microsoft Corp.'s Windows NT — and merging its server lines under the name AcerAltos.

Previously, Acer separated its servers into two product lines: the Altos family of Unix servers running its proprietary Altos/SCO Unix operating system and the AcerFrame family of servers for off-the-shelf operating systems such as Novell, Inc.'s NetWare.

While analysts said the need for server companies to support Windows NT was a given, they said the merger of the two Acer lines would give the company's server strategy cohesion and strengthen its presence in the value-added reseller (VAR) channel.

"Merging the lines will help clear up confusion over what Acer is doing with Altos, which will help it keep a strong relationship in the VAR channel in light of competition from minicomputer makers primarily Unisys and DEC," said Randal Giusto, an analyst at WorkGroup Technologies, Inc. in Hampton, N.H. Merging the lines will also give users one point of contact for support, he added.

The following three models are the first to debut under the AcerAltos name:

- 17000: A high-end, symmetric multiprocessor server for more than 32 users, supports up to four 60-MHz Intel Corp. Pentium CPUs. Starts at $12,000.
- 7000: A midrange server for eight to 64 users, available with a 66-MHz I486DX2 or 60-MHz Pentium CPU. Starts at $3,350.
- 700: An entry-level server for one to 16 users, available with a 33-MHz 486DX or 66-MHz 486DX2 CPU. Starts at $1,300.

Windows NT support

The symmetric multiprocessing capabilities of the 17000 provides Acer's first support for Windows NT and Windows NT Advanced Server. Other operating systems Acer supports include Banyan Systems, Inc.'s Vines, The Santa Cruz Operation's SCO Unix and IBM's OS/2.

With the addition of NT support, Acer is positioning itself to capture share in a market with enormous potential for growth, said Norman Choy, group product manager for advanced systems at Acer in San Jose, Calif. "If NT is even just moderately successful, it will still represent a huge installed base that we want to get in on," Choy said.

The biggest challenge for Acer is trying to meet users' mission-critical needs, according to Ronald Chwang, president and chief operating officer. "If a server goes down, IS is under extensive pressure to bring it back up quickly without losing data," Chwang said. "As server companies, we need to provide as reliable a product as is possible to help alleviate this pressure."

To boost server reliability, Acer offers disk mirroring and dual power supplies on selected AcerAltos models, bringing the total number of configurations to 29. And, although he declined to give specifics, Choy said customers can expect to see an external redundant arrays of inexpensive disks (RAID) subsystem early next year.

The lack of a RAID subsystem is a major hole that Acer needs to fill — and quickly, Giusto said. "A RAID subsystem is an absolute necessity for server companies," he said. "If Acer can't come out with one by the end of the first quarter, it will be a problem for them."

CPU:
Up to four 60-MHz Pentium microprocessors

CACHE:
256K-byte, second-level write-back cache per CPU

MEMORY:
32M bytes of RAM, expandable to 256M bytes

EXPANSION:
Eight 32-bit EISA slots, two 16-bit XT/AT bus slots

PRICE:
Ranges from $12,000 to $50,000

Vendors deliver turnkey LAN platform

By Stephen P. Klett Jr.

A vendor alliance led by ITT Datacom has announced a turnkey networking platform to help users over the compatibility hurdles associated with running high-speed LANs over copper cabling.

Called ISNS-100, the platform consists of ITT Datacom's Structured Cabling System (ISCS); DeskPro M and I workstations and ProSignia and ProLiant servers from Compaq Computer Corp.; and copper Fiber Distributed Data Interface (FDDI) network adapters and intelligent hubs from SysKonnect, Inc.

ISCS is ITT Datacom's proprietary wiring design for running FDDI over copper. According to the company, it supports data transmission rates of up to 100M bit/sec. over distances of up to 155 meters.

Less compatibility testing

With ISNS-100, the alliance hopes to reduce the technology adoption "window" for companies looking to install advanced networking technology by eliminating the need for users to test, evaluate and prototype disparate network products for compatibility, said Kevin Johnson, director of North American operations at ITT Datacom in Santa Ana, Calif.

This is the primary reason beta user MCI Telecommunications Corp. in Colorado Springs decided to give ISNS-100 a try, according to Charles Stallings, senior communications engineer. Usually, he said, FDDI requires a "piecemeal" approach. "It's not that you couldn't do it, but you had to put your own blood, sweat and tears into it," he said.

While analysts said the ITT Datacom cabling offers superior performance compared with traditional Category-5 cable, they questioned if it was worth the roughly 30% higher cost to users.

"These guys have a lot of evangelism to do . . . because no one seems to be screaming for higher capacity than Category-5," said Todd Dagres, vice president of data communications research at The Yankee Group in Boston. "Your average PC LAN is going to be perfectly happy with Category-5 for at least the next 20 years."

In addition, Dagres said the long-term prospects for ISNS-100 were limited because most users will probably go to fiber or wireless LANs.

First announced at Interop August '93 [CW, Aug. 30], ISNS-100 will ship in January and is now being sold through ITT Datacom. Pricing information was not available.

Compaq's much-publicized backlog woes, though of "major concern," are not expected to impact ITT Datacom's delivery date, Johnson said. The main reason for his confidence, he added, is that Compaq has guaranteed ITT Datacom preference over any other reseller.

Johnson also acknowledged that installing ISNS-100 forces users to "embark on a complete rethinking of their network" because it requires laying in new cabling and new desktop equipment. However, he said ITT Datacom does not see this as a barrier to the technology's implementation because less than one-half of 1% of existing cabling schemes can support high-speed copper transmission. "Users seriously considering the technology know they have to make major changes," he said.

More on the way

ITT said it plans to provide versions of ISNS-100 for emerging technologies such as fast Ethernet and Asynchronous Transfer Mode as well.

Network management

Exide offers power monitoring software

By Elisabeth Horwitt

Exide Electronics Group, Inc. has announced OnliNet 3.0 NVX, said to be the first network power management software to provide real-time information on the quality of incoming power for combined Novell, Inc. NetWare and Unix networks.

The product is also said to monitor and record performance data for uninterruptible power supplies (UPS) at the same time that it conditions and protects the system from surges and spikes coming in from the utility.

Users can monitor power quality as well as the status of UPS devices on Novell and Unix networks from a graphical user interface that displays power and battery conditions on real-time graphic charts. Also included are meter graphics, event logs and information on UPS performance. The product can also do scheduled shutdown and restart of networked NetWare and Unix systems.

Exide's Powerware network power management software family provides power management for OS/2, Microsoft Corp.'s Windows NT, NetWare and a variety of Unix systems, including Novell's UnixWare, the vendor said.

The product family includes power management systems that can report power system status to a Simple Network Management Protocol-compliant network management platform.

Unix systems

CONTINUED FROM PAGE 51

ers as test sites for the new machines, Hudlow said. Kansas City already has its workstations, and the Minneapolis units were being installed last week, he said.

Those sites are just two of 12 regional River Forecasting Centers in the continental U.S., he said, but last summer's flooding created "more pressure for them to come up to speed" with the new systems. Other forecasting sites will not get their machines until 1995 or 1996; full-scale production at all sites begins in 1996.

The use of Unix and standards is part of a broader federal move to migrate from proprietary mainframes to open systems, according to George Smith , a research hydrologist in the Office of Hydrology's Silver Spring, Md., headquarters. "In 1990, the Office of Hydrology recognized that we needed to start moving into a Unix and X Windows environment," Smith said. "We can build an interface to a [Unix] standard and know that those functions will be available on any vendor's Unix."

That will protect National Weather Service's investment in new computers and system software, he added.

The new Unix applications, which are being developed in C language, will support the Open Software Foundation's Motif graphical user interface and relational databases from Informix Software, Inc., Smith said.

Originally, the forecasting software was built in 1990 to run on an IBM RT and then on an IBM RS/6000, he said. Some of the IBM RS/6000 systems are running in several forecasting offices as prototypes, but PRC is porting all applications to the HP workstations. At the time of the AWIPS bid, the HP machines were faster. The AWIPS software and hardware was tested for two years in Tulsa, Okla. on an RS/6000.

Rollout ready

The National Weather Service intends to place Unix systems at 115 forecasting offices nationwide by 1996. The systems, which have been piloted for two years, will be deployed early in Kansas City, Mo., and Minneapolis to monitor river flooding from the Mississippi and Missouri Rivers, according to the National Weather Service's Office of Hydrology.

New Products

Conner Storage Systems, a division of **Conner Peripherals, Inc.**, has added Backup Exec for NetWare 4.0 software to its MS series line of digital audio tape, ¼-inch cartridge, digital linear tape and helical scan backup products.

According to the Lake Mary, Fla., company, the software provides support for Novell, Inc.'s NetWare 3.x and 4.x, including directory services and support for Novell's Storage Management Services initiative.

Backup Exec for NetWare 4.0 offers a variety of disk backup and disk management features and provides data management functions that include job scheduling, file grooming and reporting.

Backup Exec for NetWare 4.0 costs $995.

▶ *Conner Storage Systems*
(407) 263-3500

JetForm Corp. has announced an interim release of JetForm for E-Mail 3.1 that supports VIM 2.0, the electronic-mail application programming interface for Lotus Development Corp.'s CC:Mail and Notes Mail.

According to the Waltham, Mass., company, JetForm for E-Mail is a multiplatform, intelligent forms fill-in product that includes a set of work-flow tools.

Used with standard E-mail systems, JetForm for E-Mail fills forms and routes information throughout a corporation by using existing equipment and networks.

Work-flow features such as forms routing and tracking are offered.

The interim upgrade to JetForm for E-Mail costs $25 for all current users.

▶ *JetForm*
(617) 647-7700

Platinum Software Corp. has announced Platinum for Windows, a LAN-based financial accounting system.

According to the Irvine, Calif., company, Platinum for Windows shares a common data model with and is constructed on the same tool set as the client/server-based Sequel to Platinum.

The product includes integration with other desktop applications, an advanced report generator, work-flow capabilities, a graphical user interface with the enhanced look and feel of Excel 5.0 and an improved help system.

Prices for Platinum for Windows range from $1,500 to $15,000 per module.

▶ *Platinum Software*
(714) 727-1250

NetGuard Systems, Inc. has announced the NSI 7000, said to be a fail-safe subsystem for network file servers.

According to the Seal Beach, Calif., company, the product was designed to protect Novell, Inc. NetWare-based LANs from catastrophic hardware and software failures at both the server and the disk drive levels.

A virtual file server architecture that produces a complete fail-safe environment for mission-critical LAN applications is used in the subsystem.

NSI subsystems include two NetGuard NetWare Loadable Modules and a DOS executable program.

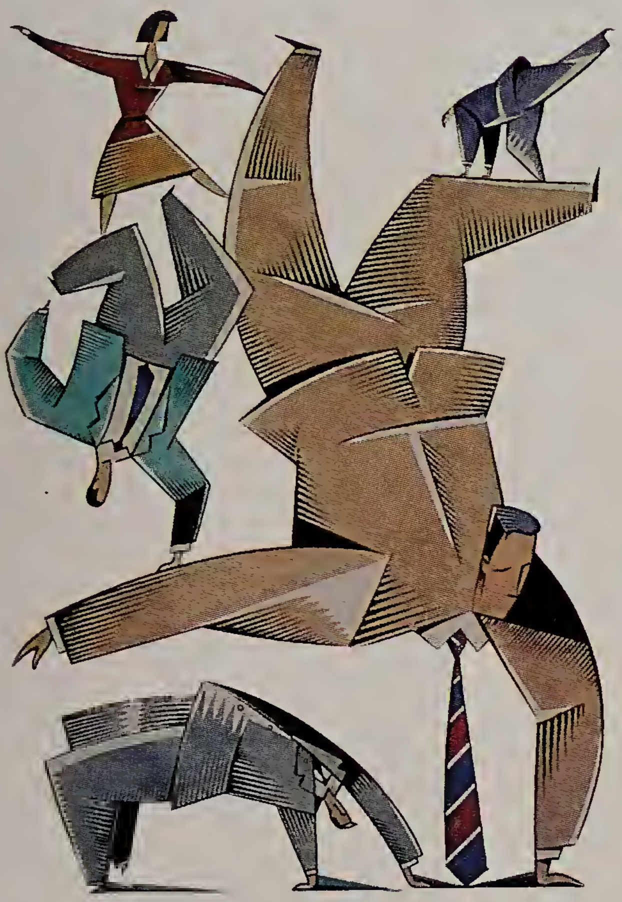
The NSI 7000 subsystems prices start at $8,995.

▶ *NetGuard Systems*
(310) 799-5533

Digital
Update

December 1993

LinkWorks SOFTWARE: TEAMWORK AT ITS BEST



Digital's LinkWorks product is an object-oriented, client/server-based software framework that enables people using different desktop applications and electronic mail systems anywhere in your organization to work together, sharing not only text, but images and multimedia, in cross-functional project teams.

This client/server-based software can also help you manage workflow through features such as revision control, event notification, serial, parallel, and conditional routing, and electronic sign-off. With LinkWorks software, managers can easily design and define workflow for projects and processes. Contributors can continue to use their applications of choice; tailor their own easy-to-use, icon-based working environment; share screens; and keep private and shared workspaces separate.

In addition, LinkWorks software enables existing applications to be integrated across departments through a unique encapsulation tool kit. Any popular desktop program can be used as part of the overall solution.

Get Ready for Dramatic Productivity Increases

LinkWorks software has proven itself in real-world workgroup applications. And it can work for you, too. This powerful software has the capability to help you easily and continually simplify work processes, resulting in gains in productivity of not just 10 percent or 20 percent, but many times over. Currently, LinkWorks software supports approximately ten thousand users worldwide.

Today, the LinkWorks product connects Digital's current ALL-IN-1 and TeamLinks product sets *(see article inside)*. And it supports Macintosh, Microsoft Windows-based PC and UNIX clients, and Intel-based SCO UNIX, RISC ULTRIX, and DEC OSF/1 AXP servers. Future releases will support the Windows NT, OpenVMS AXP, and OpenVMS VAX platforms. LinkWorks software also will support Presentation Manager on OS/2 and connected clients for Microsoft Windows.

FOR MORE INFORMATION ON DIGITAL'S LinkWorks PRODUCT, CALL 800-DIGITAL (800-344-4825), AND REFERENCE CODE BHF.

LinkWorks SOFTWARE GIVES YOU THE CAPABILITY TO EASILY AND CONTINUALLY SIMPLIFY WORK PROCESSES — RESULTING IN GAINS IN PRODUCTIVITY OF NOT JUST 10 PERCENT OR 20 PERCENT, BUT MANY TIMES OVER.

LinkWorks SOFTWARE SPELLS SUCCESS

Bank of Montreal uses solutions based on LinkWorks software to integrate 44 different corporate systems. Now, employees can easily gain a complete and up-to-date picture of each customer's relationship with the Bank — while ensuring that confidential information remains secure. And the savings in time is impressive. For example, the Bank estimates that the system reduces the time to prepare a credit application by an entire day.

After only one month of using the system, the pilot group unanimously voted to adopt the system — a pleasant surprise for even the most optimistic members of the project team.

VW-GEDAS, an organization that develops information solutions for its parent company, Volkswagen, as well as for other clients, is using LinkWorks software to help a customer streamline its business processes. "The new system supports sales, logistics, and communications throughout the company," said Stefan Wiesner, VW-GEDAS executive. "It cuts response time and improves customer satisfaction."

Before choosing LinkWorks software, Wiesner evaluated numerous alternatives. "We chose LinkWorks software because it's much more in the future. It's completely object-oriented, it's secure, and the workflow component is outstanding," he explained.

THE VT510 TERMINAL UP CLOSE

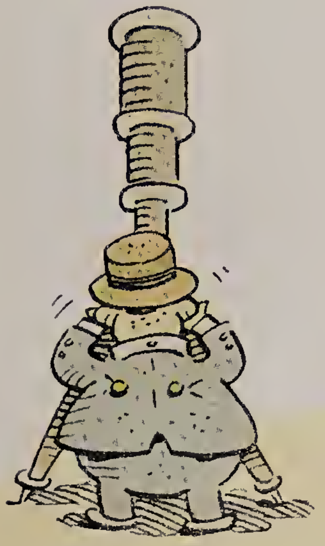
Great Features at a Low Price

You want to upgrade your company's text terminals, but, like everyone else, your budget is tight. The answer? A flexible, low-cost ANSI terminal that's also highly reliable in a multivendor environment — one that supports more than 30 operating systems and requires no change to your existing applications, building wiring, or communications protocols. That's what you get with Digital's family of plug-and-play VT510 single-session text terminals. Carrying a three-year warranty along with a low price tag of $419, the VT510 terminal is one of the best buys in the industry.

The VT510 terminal offers 17 terminal emulations and is ideal for business professionals who manage multivendor environments including ANSI and ASCII protocols and multiuser DOS or SCO UNIX applications requiring PC desktop devices.

In addition, the terminal's advanced design will impress users with features including an easy-to-use Windows-like setup (with a choice of five setup languages), high resolution and refresh rate, and a fully programmable keyboard that supports 25 languages.

The VT510 terminal meets worldwide requirements, no matter where your offices are based. What's more, it is available with white, green, or amber phosphors — and offers a choice of VT-style and enhanced PC-style keyboards. A low-emissions model is also available.



TO ORDER DIGITAL'S VT510 TERMINAL OR FOR MORE INFORMATION, CONTACT YOUR DIGITAL SALES REPRESENTATIVE.

WORK MADE EASY AT SYSTEM ENGINEERING CUSTOMER CENTER

Digital Experts, Resources, and Tools at Your Fingertips

We're not kidding when we say Digital is doing everything possible to meet the needs of our customers. And we've made major investments in order to accomplish exactly that. A prime example? The recent opening of a technology lab where our customers can utilize direct and dedicated system experts, system resources, and specialized tools to help them build and test complex technology solutions. In other words, we've taken our own internal engineering competencies and opened them up to you — and your business.

The System Engineering Customer Center, located in Salem, New Hampshire, is designed to provide complete access to the expertise, equipment, tools, networks, and applications needed to architect, design, implement, and characterize solutions that require resources beyond those available at the vast majority of customer sites. Your link to lab facilities is Digital's Team Work Center — a fully equipped setting structured to meet your business, security, and comfort requirements. Alternatively, you could connect remotely to a configuration that has been installed to your specifications.

But the support doesn't stop there. Our System Engineering Team is available to help you succeed. Whether you are tuning an existing configuration, running your application on a new system platform, experimenting with operational changes, integrating complex applications that require customized software solutions, or trying out a whole new idea, the staff is ready to help you maximize the effectiveness of your system.

Distinctive Advantages

Digital's System Engineering Customer Center offers you all the resources that have made Digital an industry leader, including:

- A Comprehensive Blend of Skills and Expertise

The Center's staff is experienced in system-level testing, characterization, and ongoing engineering support. Plus, they have proven system-level consulting skills, along with software design and integration expertise.

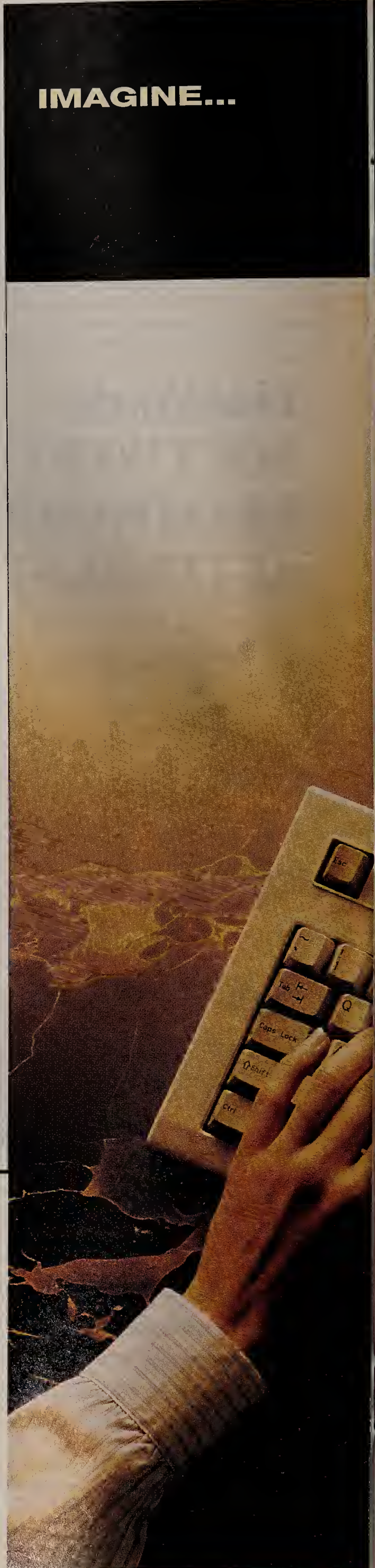
- Unique Asset Base

With more than 22,000 square feet of lab floor space, our own loading dock, and networks capable of staging multiple test systems simultaneously, Digital has developed extraordinarily cost-effective methods for staging everything from standalone systems to the world's largest clusters. Plus, we have inventory capable of meeting most customer configuration requirements, including the ability to assure high system availability.

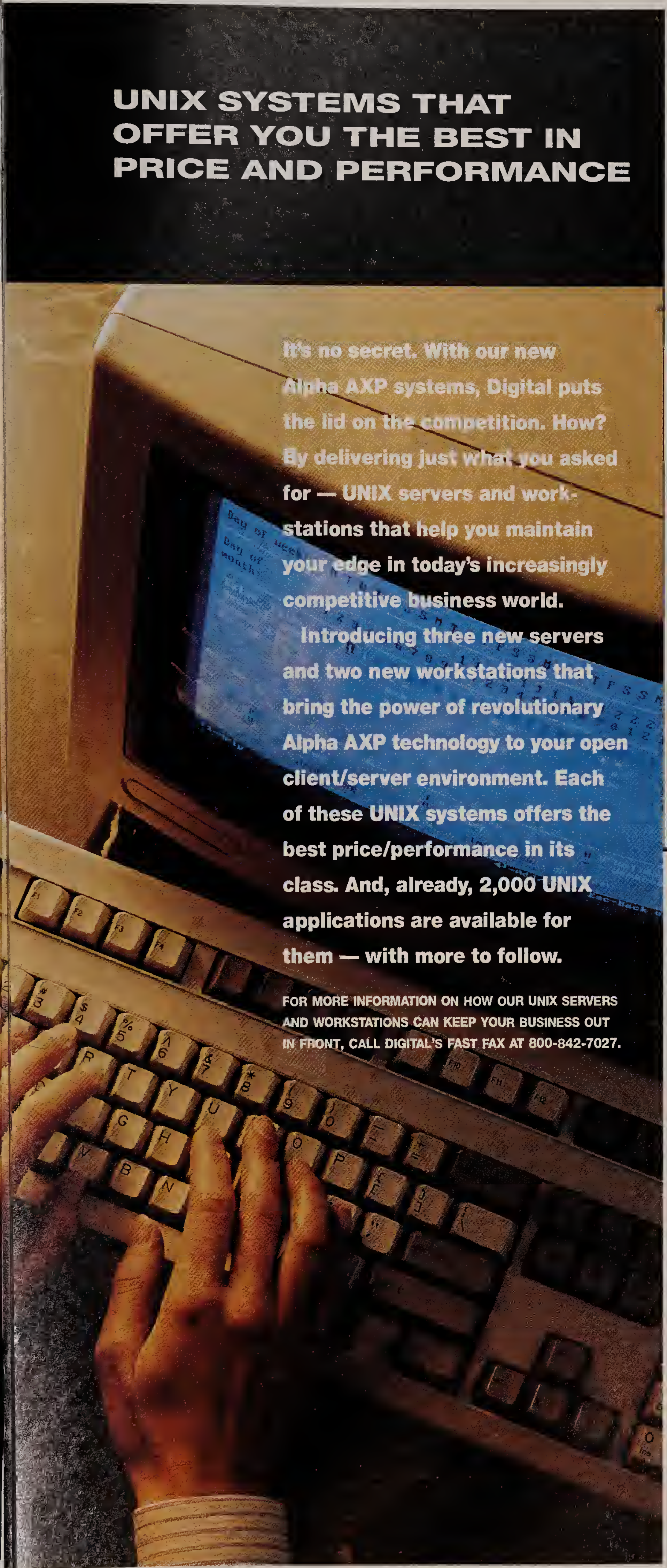
- Follow-through and On-time Delivery

We provide process and project management expertise for well-planned and efficient project execution. At Digital, we have worked hard to develop the right staff and facilities to meet time-critical requirements.

FOR MORE INFORMATION ON DIGITAL'S SYSTEM ENGINEERING CUSTOMER CENTER, CALL DAVE LEADER AT 609-854-5165 (EASTERN AND CENTRAL TIME ZONES) OR GLENN ENGLUND AT 719-661-8371 (MOUNTAIN AND PACIFIC TIME ZONES).



digital™



UNIX SYSTEMS THAT OFFER YOU THE BEST IN PRICE AND PERFORMANCE

It's no secret. With our new Alpha AXP systems, Digital puts the lid on the competition. How? By delivering just what you asked for — UNIX servers and workstations that help you maintain your edge in today's increasingly competitive business world.

Introducing three new servers and two new workstations that bring the power of revolutionary Alpha AXP technology to your open client/server environment. Each of these UNIX systems offers the best price/performance in its class. And, already, 2,000 UNIX applications are available for them — with more to follow.

FOR MORE INFORMATION ON HOW OUR UNIX SERVERS AND WORKSTATIONS CAN KEEP YOUR BUSINESS OUT IN FRONT, CALL DIGITAL'S FAST FAX AT 800-842-7027.

ALL THANKS GO TO TeamLinks SOFTWARE

ALL-IN-1 Software Is Right at Home in Your Client/Server Environment

The ALL-IN-1 Integrated Office System is Digital's proven application integration and development platform for delivering personal and workgroup applications as well as customized business solutions. And now, with businesses migrating to more productive and cost-efficient distributed environments and end users requesting more choice of personal applications on the desktop, Digital has extended ALL-IN-1 software to embrace client/server technology. How? Through the implementation of ALL-IN-1 server components and TeamLinks software as a client to an ALL-IN-1 server. This means that millions of ALL-IN-1 users around the world can take advantage of all the features of Windows and Macintosh PCs while maintaining connectivity and high throughput to existing information sources, documents, and mail and directory services of the ALL-IN-1 product.

And that's not all. With the evolution of ALL-IN-1 software to client/server, Digital has implemented a new pricing scheme in support of TeamLinks clients, making this combination the most cost-effective solution available today. Plus, our commitment to ship TeamLinks for ALL-IN-1 on the Alpha AXP platform by summer 1994 enables even better price performance along with greatly enhanced X.400 mail capabilities.

TeamLinks Software: For Seamless Electronic Mail Service

If your organization is searching for a way to communicate through diverse systems and messaging services, Digital leads you to the best solution. TeamLinks Mail Version 2.0 acts as a client to your ALL-IN-1 (Version 3.0) or DEC MAILworks server — providing seamless electronic mail service no matter how many networks and applications your business utilizes. And at a cost as low as $49 per client (depending on quantity purchased). And how does TeamLinks software fit in with Digital's LinkWorks product, the object-oriented, open systems platform for integrating applications? The answer is simple. Digital is committed to establishing TeamLinks software as the preferred integrated application in the LinkWorks desktop environment.

FOR A LIMITED TIME, TeamLinks MAIL FOR WINDOWS (QB-0N1AC-AA) IS AVAILABLE AT $49 PER CLIENT — A SAVINGS OF $30 PER CLIENT — WHEN PURCHASED AS A 50-LICENSE PACK. TO ORDER, OR FOR MORE INFORMATION ON TeamLinks OR ALL-IN-1 SOFTWARE, CALL 800-DIGITAL (800-344-4825), AND REFERENCE CODE BHF.

TALK ABOUT GREAT PERFORMANCE

WHEN FACED WITH RAPIDLY CHANGING NEEDS FOR HIGH-PERFORMANCE NETWORKING, YOUR ANSWER IS DIGITAL'S GIGAswitch FDDI CROSSBAR SWITCH. The GIGAswitch is an intelligent, high-speed switching bridge that employs multiple dynamic FDDI links for unprecedented LAN throughput and connectivity.

Utilizing revolutionary architecture and custom CMOS crossbar chip technology developed and manufactured by Digital, the GIGAswitch provides up to 6.25 million dynamic connections per second through a 3.6 gigabit-per-second switching fabric.

The result? You achieve a flexible, cost-effective way to create high-performance LANs.

Protocol and vendor independent, Digital's GIGAswitch offers performance scaling to meet the needs of any size system — giving you the freedom to choose where and how your applications and information are used, regardless of computer platforms or FDDI network components. In short, the GIGAswitch protects your existing investment in FDDI technology and training. And, with the ATM line card, it paves the way for smooth migration to ATM when you're ready.

PRODUCT	ORDER NUMBER	PRICE
GIGAswitch with 2-port FDDI card	DEFGA-BA	$30,000
Redundant Switch Control Processor (SCP) option	DEFGP-AA	15,000
Redundant power supply option	DEFGB-AA	3,000
2-port FDDI line card	DEFGL-AA	9,000
Multi-Mode fiber ANSI MIC PMD	DEFXM-AA	835
Single-Mode fiber ANSI ST PMD	DEFXS-AA	3,166

TO ORDER DIGITAL'S GIGAswitch PRODUCT, CALL 800-DIGITAL (800-344-4825), AND REFERENCE CODE BMY.

Digital
Update

December 1993

BREAKING THE LOGJAM AT HAMMOND LUMBER

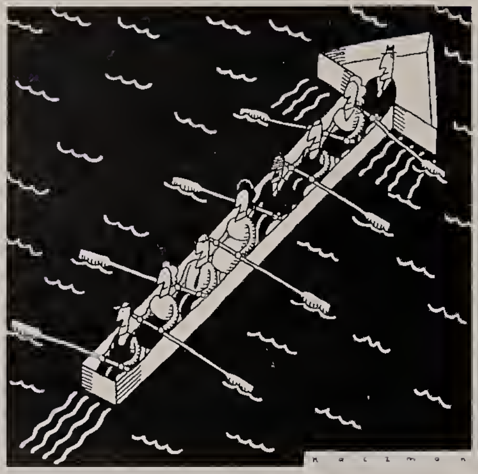
DISKEEPER Software and Alpha AXP Technology Make It Happen

Earlier this year, Hammond Lumber hit a logjam. Its VAX 4000 Model 200 system — with as many as 130 user processes running point-of-sale accounting, credit, and inventory applications — clearly needed an upgrade. Over time, the system had been handling more and more users, resulting in a gradual decline in response time.

Based in Belgrade, Maine, Hammond Lumber is a chain of five retail outlets, plus one sawmill operation. Tom Jewett, the company's computer consultant, helped Hammond executives make the decision to move to Digital's Alpha AXP platform.

Jewett also advised that the company continue to utilize Executive Software's DISKEEPER application for disk defragmentation. DISKEEPER software had succeeded in efforts to keep Hammond's VAX system working at peak efficiency. Plus, it was already shipping on the OpenVMS Alpha AXP platform.

Hammond executives also discovered that the application development environment they wanted — namely, Synergy Application Development Environment from Digital Information Systems Corporation (DISC) of Rancho Cordova, California — ran on the Alpha AXP platform. Because Tom Jewett and Hammond developers write the company's applications, a sophisticated application development environment was essential.



> **"OUR NEW APPLICATION DEVELOPMENT ARCHITECTURE DEMANDS MORE FROM A COMPUTER SYSTEM. WE THOUGHT WE COULD GET THE PERFORMANCE WE NEEDED FROM THE ALPHA AXP PLATFORM AND DISKEEPER SOFTWARE. WE WERE RIGHT."**
>
> **TOM JEWETT, CONSULTANT**
> **HAMMOND LUMBER**

"The choice to move to the Alpha AXP platform was pretty straightforward once we realized how much CPU power and memory we would get," Jewett explains. "Plus, the immediate availability of DISKEEPER for the Alpha AXP platform and Synergy software reassured us that the software environment we needed would be easy to implement on the new system."

Digital's 21st century architecture will see Hammond well into the future. "The Alpha AXP platform gives us plenty of power for the more sophisticated inventory application that we plan to implement," says Jewett. This application can support an inventory database of up to 10,000 items and has the sophisticated indexing support needed to do complex database lookups quickly.

Award-Winning Efficiency for OpenVMS Systems

For the past six years in a row — each year that it's been on the market — Executive Software's DISKEEPER product has won a *Digital News & Review* Target Award for "Best Resource Management Software" product. Target Award winners are selected by votes from Digital system users.

DISKEEPER software is a customized disk defragmenter that converts fragmented files and spaces to contiguous files while user jobs are running, without loss of data and without interfering with system activity.

The utilization of DISKEEPER software results in OpenVMS disks that are "well-kept" or that have the most free space, usually in one large contiguous area. As a result, DISKEEPER software maximizes the I/O efficiency of OpenVMS.

The first company to port a disk defragmentation product on the Alpha AXP platform, Executive Software found the porting process to be straightforward, with virtually no code modifications.

"Digital's Alpha AXP technology will broadly impact the computer industry," says Craig Jensen, Executive Software CEO. "Disk I/O will probably become the most critical limitation to the performance power of the Alpha AXP platform, and DISKEEPER software has a reputation for speeding this up."

For Hammond Lumber, the combination of DISKEEPER software and Alpha AXP technology has been an unqualified success. Says Tom Jewett, "Without any reprogramming, we've cut the time for batch jobs by 66 percent."

FOR INFORMATION ON DISKEEPER SOFTWARE, CALL EXECUTIVE SOFTWARE AT 800-829-4357. FOR INFORMATION ON SYNERGY, CALL DIGITAL INFORMATION SYSTEMS CORPORATION AT 800-FON-DISC (800-366-3472).

NEWS NOTES

Alpha AXP Systems Now Available on Internet

There's something new on Internet. It's a DEC 4000 AXP system running the DEC OSF/1 UNIX operating system — enabling users to evaluate the Alpha AXP architecture and test the functionality of the supporting operating systems, compilers, tools, and utilities.

This system runs version 1.3 of the DEC OSF/1 UNIX operating system and new versions of compilers and layered software. Digital also expects to connect a similar DEC 4000 AXP system running the OpenVMS AXP operating system in the near future. To register for an account, Internet users should telnet or rlogin to axposf.pa.dec.com (Internet address 16.1.0.14), log in as axpguest (no password), and answer a qualifying questionnaire.

We'll Help You Clean Up Your Office

Do you have a lot of unused computer equipment cluttering your office? Unsure of how to dispose of it? Let Digital help. Our Product Disposition Service is available to anyone who has any type of unwanted or unneeded computer equipment in any volume.

The low, fixed fee for this new, environmentally responsible disposition service includes the secure disposition of your equipment. Plus, you receive Digital's indemnification certificate — for liability against improper disposal.

TO ORDER, OR FOR INFORMATION ABOUT DIGITAL'S PRODUCT DISPOSITION SERVICE, CALL 800-DIGITAL (800-344-4825).

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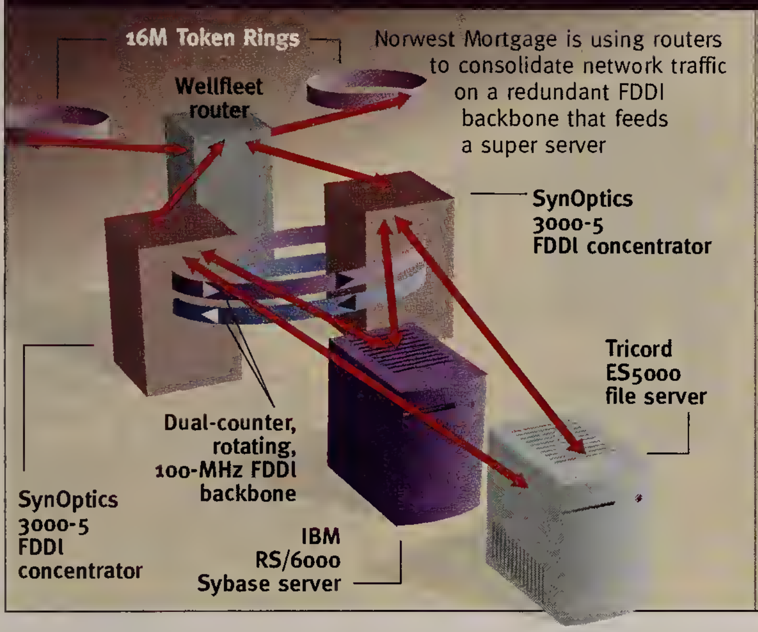
LOW-COST OPTIONS FOR T3 SERVICE, 60
NEW PRODUCTS, 61

Searching for the perfect LAN

By Lynda Radosevich
MINNEAPOLIS

Scrambling to support a fast-growing company and new business procedures, the information systems organization at Norwest Mortgage, Inc.'s Minneapolis division has spent the last two years constantly revamping its network infrastructure.

Norwest Mortgage network


16M Token Rings
Wellfleet router
Norwest Mortgage is using routers to consolidate network traffic on a redundant FDDI backbone that feeds a super server
SynOptics 3000-5 FDDI concentrator
Tricord ES5000 file server
Dual-counter, rotating, 100-MHz FDDI backbone
SynOptics 3000-5 FDDI concentrator
IBM RS/6000 Sybase server

NORWEST MORTGAGE IS ALSO USING THESE PRODUCTS:

***An internally developed Windows-based application operating as a front-end Sybase database.**

***SysKonnect FDDI adapters.**

***Intel Token Ring cards to the desktop.**

***Novell NetWare 3.11 (1,000-user version).**

Each initiative has unearthed new issues, but the division has settled on a stable, distributed computing network and diskless PCs in order to keep mortgage-related documentation moving.

"There's always problems associated with any change. We just hoped to outweigh them with the new benefits," said Matt Jacoby, a senior network analyst at the Minneapolis division's Management Information Data and Services (MIDAS).

After several false starts, the company is using a highly reliable, distributed yet centrally managed network architecture. It includes one router to "collapse" network traffic from many Token Rings onto a redundant Fiber Distributed Data Interface (FDDI) backbone that feeds one super file server and database server (see chart).

"Right now we see every business sector beginning to deploy this type of network design because of improved management capabilities, greater security and easier network troubleshooting," said Fred J. McClimans, program director of local-area communications at the Gartner Group, Inc. in Stamford, Conn.

The collapsed architecture allows Norwest Mortgage to run a Windows-based mortgage-tracking application for 700 users at high speeds, and it has "zero" downtime, according to Eric Nystrom, MIDAS integrated systems manager.

Norwest Mortgage's Minneapolis division provides the final processing of Norwest's mortgage documentation and prepares the mortgages for resale to outside companies. Norwest Mortgage, headquartered in Des Moines, Iowa, has branches around the country. The 700-employee Minneapolis division receives and processes more than 2,000 Federal Express Corp. shipments of closed mortgages each day.

ON SITE

Norwest Mortgage
Minneapolis

Business goal: To support the processing needs of fast-growing mortgage processing business.

Technology goal: To improve system flexibility and cost efffectiveness while adding users and switching to Windows-based applications.

Method: Consolidate servers and move to a centrally managed "collapsed" FDDI backbone.

Result: Improved reliability and 25% better end-user response time; IS control over the spread of servers.

Two years ago, Norwest Mortgage processing systems were based on IBM mainframes. Then, at the beginning of a companywide business process restructuring effort, senior management encouraged divisions to move to distributed systems. This was done to provide more sophisticated end-user tools at users' desktops and flexible systems that could keep up with the rapidly changing financial services industry.

The Minneapolis office brought in PCs for spreadsheets and word processing. Because mortgage processing was still on the mainframe, most of the loan and mortgage analysts had both PCs and dumb terminals on their desks, according to Jacoby.

Tough beginning

In mid-1991, the MIDAS group linked the PCs on a Standard Microsystems Corp. ARCnet, but the network never jelled and the machines would only stay up for 20 minutes, according to Jacoby. So in the spring of 1992, the systems group ripped out the cabling, threw away the adapters and installed 16M bit/sec. Intel Corp. Token Ring networks, diskless Intel I486 PCs and Compaq Computer Corp. SystemPro file servers in the various departments.

Norwest, *page 60*

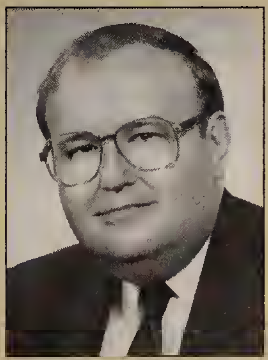
Interview

Internetworking rough spots

Much of corporate America is in the throes of blending hierarchical SNA and LAN internetworks — efforts that are posing new challenges for IS departments. Frank Dzubeck, president of Communication Networks Architects, Inc., a Washington consultancy, identified the following as the Top 5 internetworking problems that user companies face today and some possible solutions.

Problem No. 1: Lack of user confidence that smaller vendors' products can cope with the intricacies of SNA.
Solution: Several factors will work together to alleviate the confidence problem. Once interoperable Data Link Switching is available from several vendors and IBM releases Advanced Peer-to-Peer Networking with High-Performance Routing, users are likely to breathe easier.

Problem No. 2: Random time-outs of SNA sessions.
Solution: IBM's dependent logical unit structure, together with Data Link Switching, will take care of that problem.


Frank Dzubeck

Problem No. 3: Prioritization when mixing deterministic SNA traffic with nondeterministic LAN traffic. It is a mathematical nightmare that can end up with LAN traffic burstiness swamping SNA traffic.
Solution: None as yet. *(Editor's note: Several router vendors are implementing traffic prioritization schemes in their software to help in this arena. Particularly sensitive to the SNA vs. LAN traffic issue are Proteon, Inc., Advanced Computer Communications and Cisco Systems, Inc.)*

Problem No. 4: Lack of network management. Users need ways to correlate systems management and logical management (inherent in products such as NetView) with physical network management.
Solution: IBM has sold NetView on the mainframe as sort of a manager of managers because the logical and physical worlds come together in one place and you can do correlation and manage it together. AT&T's Accumaster Integrator also did this. Today there really aren't many options.

Problem No. 5: Confusion over whether frame relay is powerful enough to support multiprotocol networking and whether users should wait for Asynchronous Transfer Mode (ATM).
Solution: Frame relay is a robust solution for SNA/LAN integration, but users need to be aware of vendors that drop traffic that exceeds their committed information rate. ATM is also a good solution, but it's not here yet. When it does arrive, it will probably not be available everywhere.

Interview by Joanne Cummings, a free-lance writer in Marlboro, Mass.

FOUR MILLION PEOPLE MAKE THAT FOUR

FRANK IS A COMPUTER BUFF. IN FACT, HE'S THE UNOFFICIAL cc:MAIL ADMINISTRATOR – WHICH TAKES HIM ALL OF 45 MINUTES A WEEK.

E-mail is not just for the big guys anymore. More and more workgroups and small companies are taking the step to e-mail. Because now there's the Lotus® cc:Mail® Group Pack™ with everything you need to get ten employees up and running on the power of cc:Mail.

BRIAN, IN QUALITY CONTROL, CREATES A WEEKLY STATUS REPORT IN LOTUS 1-2-3 AND USES cc:MAIL TO CIRCULATE IT THROUGH THE COMPANY.

cc:Mail lets you send messages and files electronically — to colleagues, clients, suppliers — speeding your processes and giving you an invaluable competitive tool. cc:Mail opens lines of communication, keeps everyone in the loop and eliminates all the running around.

JOAN, THE V.P. OF FINANCE, COUNTS ON THE GROUP SCHEDULING FEATURE TO PULL MEETINGS TOGETHER EASILY.

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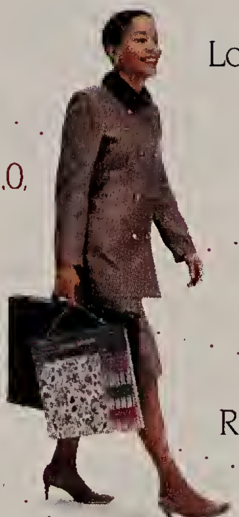

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Switch to offer low-cost T3

Lets users aggregate T1s to gain bandwidth needs

By Joanie M. Wexler

Users looking to leverage public or private broadband backbone networks but cannot afford today's stiff local-access charges for T3 services will soon receive a lower-cost option from T3Plus Networking, Inc.

The company has scaled its high-end BMX45 switch to accommodate up to seven discrete T1 (1.5M bit/sec.) access links with an inverse multiplexer, which is scheduled to ship in the first quarter of next year. The device is meant to allow users to aggregate multiple T1s to accumulate the bandwidth they need rather than foot the bill for pricey T3 links, explained Alan Menezes, director of marketing. T3 links run at 45M bit/sec.

Most inverse multiplexers on the market today run at below-T1 speeds and are used largely for dialing up bandwidth for on-demand videoconferencing.

Expanded access

Currently, users of the BMX45 have just T3 access to multimegabit backbone circuits such as fractional T3 services, he explained. Users also must have fiber or radio on their premises to use T3, while T1 is copper-based and much more ubiquitous.

"In between T1 and T3 [tariff] rates, there is a big void," said Michael Zboray, program director of enterprise network strategies at Gartner Group, Inc. in Stamford, Conn. "In many places in this country, somebody has to pull new plant for T3. At 'super-T1' rates, no one has to install new plant."

He said the $20,000-and-up inverse multiplexer "is going to really take off" because users can ratchet speeds above T1 without having to buy a "big hunk" of T3, reducing the entry barrier to high-speed networking.

For example, Thang Tran, network services engineer at T3Plus shop Southern California Edison Co., said the new capability would enable his company to back up its T3 backbone with T1 circuits and provide high-speed links to remote sites "where T3 is neither feasible nor cost-effective."

T3Plus Networking said it will add bandwidth management capabilities to the BMX45. Automatic frequency adjustment, for example, will monitor several aggregated T1s. If one fails, it will not disrupt the whole circuit of 6M or 7M bit/sec. of bandwidth; rather, the BMX45 will automatically drop out the bad line and adjust transmission frequency to lower speeds, Menezes explained.

Likewise, it will reinstate the line when it is fixed and readjust the frequency, he said.

Also, dynamic bandwidth allocation should allow network managers to specify minimum and maximum bandwidth parameters for a given application running across a given circuit.

Router technology

3Com adds frame relay, X.25 to ease low-end use

By Joanie M. Wexler

3Com Corp. recently unveiled plans to add frame relay and X.25 connections to its low-end routers that incorporate its Boundary Routing software architecture next year.

Boundary Routing, which shipped last March, shifts the complexity of router decision-making to higher-end, centralized routers. The idea is to ease installation, configuration and maintenance headaches in expertise-shy remote sites.

Frame relay is due out in the first quarter, and X.25 — aimed at the European market — is due in the second quarter, said Alison Seaman, 3Com product manager. She predicted that 3Com will have shipped 2,000 Boundary Routing-equipped devices by February.

Likes the link

The upcoming frame relay link is appealing to Barclay Williams, systems administrator at *News & Record*, a daily metropolitan newspaper and printing company in Greensboro, N.C. The reason is that the company is looking to extend its corporate network to its advertisers' sites using public network services, Williams said.

Making the connection

The initial WAN connection supported by Boundary Routing when it shipped in March was the Point-to-Point Protocol, a handshaking process that allows two devices to connect over a serial line. In May, the company added a dial-up connection to give users the option of a backup link.

"It makes economical sense for us to have a flexible link like frame relay to these sites as opposed to permanent leased lines," he explained.

Most of *News & Record*'s advertisers' submissions are shipped electronically to a service bureau where they are printed, then scanned into the newspaper's computer system, Williams said. Frame relay would eliminate the service bureau step and "also give us a huge quality improvement because of inherent difficulties in scanning," he explained.

The company first turned to Boundary Routing to make a similar arrangement with three commercial printing customers. The simplicity of the device means the customers "don't need the technical expertise to maintain it; they just make sure it's on," Williams said. "We can do all the maintenance at our end, which we should do because they're our customers."

Just plug it in

Boundary Routing is "about as simple as plugging in a microwave oven," said Ed Kurata, senior project engineer at independent networking equipment benchmarker LANQuest Labs in San Jose, Calif.

Recent testing by LANQuest showed a 50% time savings in LAN administration over a fully configured 3Com NetBuilder II, 3Com's high-end box, according to Kurata. He pointed out that the NetBuilder II has about the same configuration requirements as comparative router models from Cisco Systems, Inc., Wellfleet Communications, Inc. and other vendors.

The tests timed how long it took from unboxing the router to getting it operational. The time to add an additional protocol to the Boundary Router was cut by 90%, Kurata said, because only the hub device in Boundary Routing's hub-and-spoke-style setup needs to be configured.

A hub-and-spoke configuration means that each Boundary Router ties into just one central router, with no meshed links among remote sites.

Searching for the perfect LAN

CONTINUED FROM PAGE 57

"In some cases, the equipment was only two-months-old," Nystrom said. However, the new setup provided the stable network needed to support 300 users on a DOS-based mortage processing application that was developed in-house, he said.

But that setup was quickly outdated by business changes. The company began to grow very rapidly, spurred in part by lower interest rates. For instance, in one year, the company opened roughly 200 branch offices, according to Manny Siprut, vice president in loan production.

The postclosing operation grew to roughly 500 users, and workgroups and analysts moved around the building during reorganizations.

Few budget concerns

Unlike most IS organizations, MIDAS was and is unhampered by budget restraints because its growth means that Norwest Mortgage places a premium on technology service rather than cost-cutting, according to Jacoby.

Because the loan analysts' files were stored on local file servers, the IS group had to move quickly to keep up. Every time someone changed offices, IS had to move all the related files to a server close to that person. Otherwise, Jacoby said, "information had to hop from server to server, and performance dropped."

Despite supporting more users and applications, the network runs 70% faster on the FDDI architecture.

To rectify this, MIDAS moved to a collapsed Token Ring backbone in early summer 1992. In this scheme, each server connected directly to a port of a central router. The router, in turn, funneled data to a central backbone where file servers and other resources were located.

Although the design worked, the Token Ring backbone was soon saturated. In the fall of 1992, the postclosing operation began migrating to a new Windows application and finished moving data off the mainframe to an IBM RS/6000 server running Sybase, Inc. database software. Also, the employee pool grew to about 700.

So last June, the MIDAS group replaced five Compaq servers with a Tricord Systems, Inc. PowerFrame supersurver with fully mirrored disk drives running a 1,000-user version of Novell, Inc.'s NetWare 3.11. Consolidating the server functions simplified security and management but created a bottleneck between the server and end users' desktops. The bottleneck was compounded by the fact that diskless PCs need frequent access to the file server.

FDDI to the rescue

To break the bottleneck, the MIDAS group installed the dual-ring FDDI backbone. If one ring goes down, traffic is routed through the other. All the Token Ring traffic is collapsed into a Wellfleet Communications, Inc. router before heading onto the FDDI backbone composed of two SynOptics Communications, Inc. concentrators. Dual-attached FDDI cards from SysKonnect, Inc. allow the Tricord server, which has only one network address, to participate in the redundant ring architecture.

Despite supporting more users and bandwidth-hungry Windows applications, the network operates 70% faster due to the FDDI architecture. This means that users can process more loan documents per day, although actual productivity increases have not been measured, Jacoby said.

After toiling to create a fast, stable network, Norwest Mortgage plans to change it again, possibly as soon as a year from now. Then, the likely architecture will include an Asynchronous Transfer Mode backbone with 100M bit/sec. FDDI over copper running to the desktop.

New Products

Motorola UDS has announced the CELLect 14.4 PCMCIA and CELLect 14.4 pocket-size modems for cellular and wireline data transfer.

According to the Huntsville, Ala., company, the modems offer V.32bis 14.4 bit/sec. modems with V.42 error correction and V.42bis data compression.

The products also provide a maximum throughput rate of 57.6K bit/sec. and support standard asynchronous speeds down to 300 bit/sec.

The CELLect 14.4 PCMCIA costs $549 and the CELLect 14.4 pocket-size modem is available for $399.

▶ *Motorola UDS*
(205) 430-8000

Hewlett-Packard Co. has introduced the HP EtherTwist LAN Switch, an Ethernet LAN switch designed to increase performance on 10M bit/sec. Ethernet networks.

According to the Palo Alto, Calif., company, the product adds an Ethernet switching capability to HP's EtherTwist line of stackable 10Base-T hubs, bridges and routers.

For management and control, the product provides address-to-port references and uses on-the-fly switching to reduce the time it takes packets to move through the network.

The 10Base-T ports of the HP LAN Switch support half-duplex or full-duplex communications mode.

The HP EtherTwist LAN Switch costs $4,200.

▶ *Hewlett-Packard*
(415) 857-1501

Chipcom Corp. has introduced a family of products based on the IEEE 10Base-FB standard for running Ethernet over fiber cable.

According to the Southboro, Mass., company, the family consists of three modules for Chipcom's Online System Concentrator intelligent switching hub: a stand-alone fiber hub and two transceivers, including a dual-link, fault-tolerant transceiver.

Created primarily for building backbone networks, the products also support desktop connections such as fault-tolerant links to mission-critical servers and computers.

The family was designed for organizations with enterprise networks, typically with more than 500 users.

Prices range from $545 to $4,150.

▶ *Chipcom*
(508) 460-8900

Telepartner International has announced TeleServer, an advanced communications server designed to deliver a range of connectivity options that include support for wireless computer users.

According to the Farmington, Conn., company, Telepartner supports wireless, X.25 and asynchronous direct-dial remote access technologies while simultaneously supporting various workstation environments.

TeleServer incorporates DynaFlash, a technique that compresses outbound data by up to 80% into its server and workstation components, according to the company.

The server component is priced at $9,700 for up to 16 simultaneous users, $11,700 for up to 32 simultaneous users and $14,200 for up to 64 simultaneous users.

▶ *Telepartner International*
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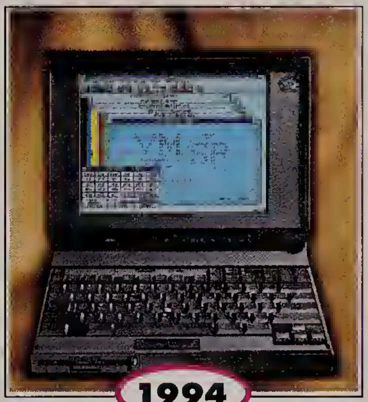

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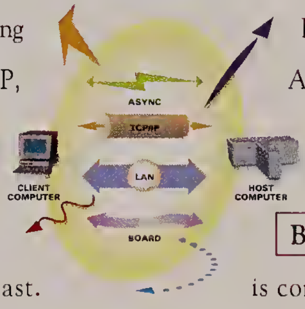

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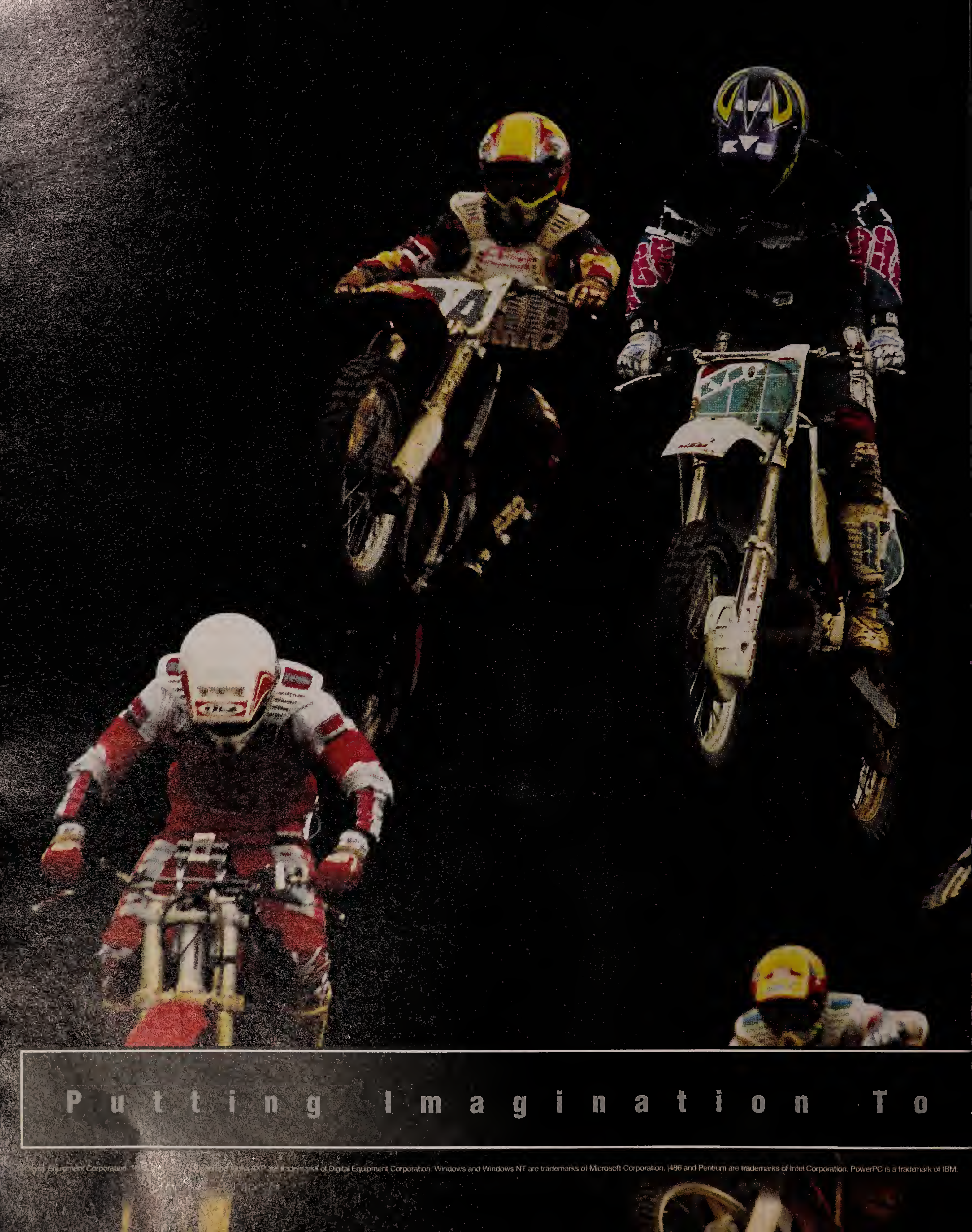

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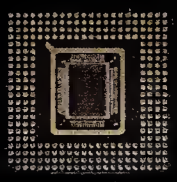

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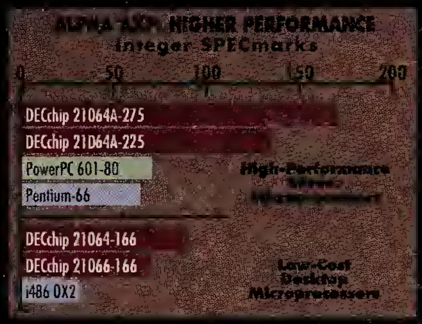

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BASICS APPLY AT DATABASE SHOW, 68
NEW PRODUCTS, 68

EIS applications

Pushing decision support beyond executive suite

By Ellis Booker

Using a broad brush for its 2-year-old executive information system (EIS), Sherwin-Williams Co.'s $1.8 billion Paint Stores Group in Cleveland has spent the past two years giving some 110 district managers access to it.

Before the EIS was deployed, managers had the unenviable task every Monday morning of telephoning the 20 to 25 stores in their districts to get sales figures for the previous week. Each manager would then draft a sales report for the district and send it up the chain of command to one of the 14 area vice presidents.

"The goal was not to get rid of the phone procedure but to give the district managers more information to work with," said Bill Thompson, director of MIS at the Paint Stores Group.

"It's kind of intuitive that you'll do better when you know more," he said.

Sherwin-Williams selected the Arthur Performance Tracking System from Comshare Retail, a division of Comshare, Inc. in Ann Arbor, Mich.

The Arthur databases, fed by NCR Corp. point-of-sale (POS) systems in the retail outlets, reside on Sherwin-Williams' Amdahl Corp. mainframe.

From the bottom up

While many EIS applications start at the top of a company and only later trickle down the organizational chart, Sherwin-Williams started the EIS application with its numerous midlevel managers and moved it up to senior executives.

According to Thompson, all the area vice presidents use the system, as does at least one of the four division heads. Senior executives have the same graphical user interface as the managers, although the executives are able to compare a larger set of stores.

Thompson's information systems staff analyzed district managers' needs and developed databases that reflect inventory movement, store and territory results and the performance of each sales representative. In the current implementation, managers can review each store's results, by product, for the previous five weeks. They can also perform "what-if" analyses on this data.

"Our idea was to produce results geographically, with a color-coded map," Thompson said, adding that the application required placing PCs on the managers' desktops.

Prior to the EIS, fewer than 15% had PCs in their offices. Thompson expanded the reach of the EIS platform by bundling spreadsheet and word processing software into the EIS application.

No global messaging

But one feature missing from the EIS is global messaging. "We've always been able to send [messages] to the stores, and we can broadcast bulletins to the district guys," Thompson said. But for now, he added, he does not see the need to have these managers message one another or send messages up the chain of command.

Thompson said the EIS, which cumulatively contains gigabytes of inventory and POS data, is only as good as the data fed into it. "We're fortunate in that we already had a pretty solid POS system," he said.

ON SITE

Sherwin-Williams Paint Stores Group
Cleveland

Challenge: To provide 110 district managers with more information about their stores.

Technology: Mainframe-based EIS from Comshare in Ann Arbor, Mich.

Results: Adopted by all district managers and a significant percentage of their superiors.

PCs to get full access to All-In-1 software

By Craig Stedman

Digital Equipment Corp. plans in the second half of next year to give PC users full access to its venerable All-In-1 office software for developing client/server applications built on graphical user interfaces (GUI). But analysts said they wonder whether the move is coming too late in the game to make much difference.

"DEC has really been behind the power curve here," said Jack Gold, a senior research analyst at Meta Group, Inc., a consulting firm in Westport, Conn. "Frankly, they should have done this a long time ago, and it's still essentially a year away. Some customers are going to be unhappy about that."

"This is what people wanted five years ago," said another industry analyst, who asked not to be identified. He noted that Digital has supported PCs under All-In-1 since 1986, but thus far it has not opened up the product's scripting language to desktop application developers. As a result, the company has limited the usefulness of the PC support.

That will change with the next major releases of All-In-1 and Digital's PC-based TeamLinks office client software, said Stephen Martin, marketing manager for the company's messaging and workgroup systems. Both are expected to ship during the third quarter of next year, he added.

TeamLinks currently can access data stored in All-In-1 file cabinets and use All-In-1 as a mail server. Martin said the next releases of the products will give TeamLinks access to the All-In-1 scripts, allowing development of GUI-based applications using Microsoft Corp.'s Visual Basic language.

Existing All-In-1 programs written for terminals can be modified with the addition of a PC front end, providing "a relatively inexpensive way to turn a host application into a client/server application," Martin said. The back-end All-In-1 code would require only "minor changes," he added.

May lose customers

Digital hopes the PC scripting capability will help keep customers from moving off All-In-1 as they shift from terminals to desktop systems. The company estimates that All-In-1 still has 4 million individual users, although some analysts said they think the figure is much smaller.

One customer no longer on the All-In-1 bandwagon is GTE Telecommunications Products and Services in Atlanta. George Kerns, assistant vice president for cellular information management at the GTE unit, said its strategic mail platform is now Microsoft Mail running over Novell, Inc. NetWare LANs.

GTE is still using some All-In-1 applications developed internally, such as a jobs listing program and software written for its legal department, Kerns said. But he described All-In-1 as "a waning product" and said the company plans to phase it out over an undetermined period of time.

The planned PC support would not be enough to change Kerns' mind. "Even if they kind of refresh [All-In-1] a little bit, it's not going to get any new momentum from our side," he said. "The water's already over the dam."

Tom Koulopoulos, president of Delphi Consulting Group, Inc. in Boston, said he views Digital's plan for All-In-1 "as a survival strategy more than anything else." The installed base would get "a nice comfortable approach for moving into client/server," but interest in the product is still likely to decline, he added.

May grow old

Martin acknowledged that as users become interested in developing distributed, object-oriented applications during the next few years, All-In-1 will no longer fit their needs.

Digital wants to entice those customers to switch to its new LinkWorks workgroup integration software, with All-In-1 possibly retaining a role as a background network services package for mail and other applications.

LinkWorks is the company's key office software product for the future, Gold said. The product, introduced in October, is fine technically, but questions remain about whether it can be marketed effectively, he said.

"Let's face it, Digital is not a marketing company," Gold said.

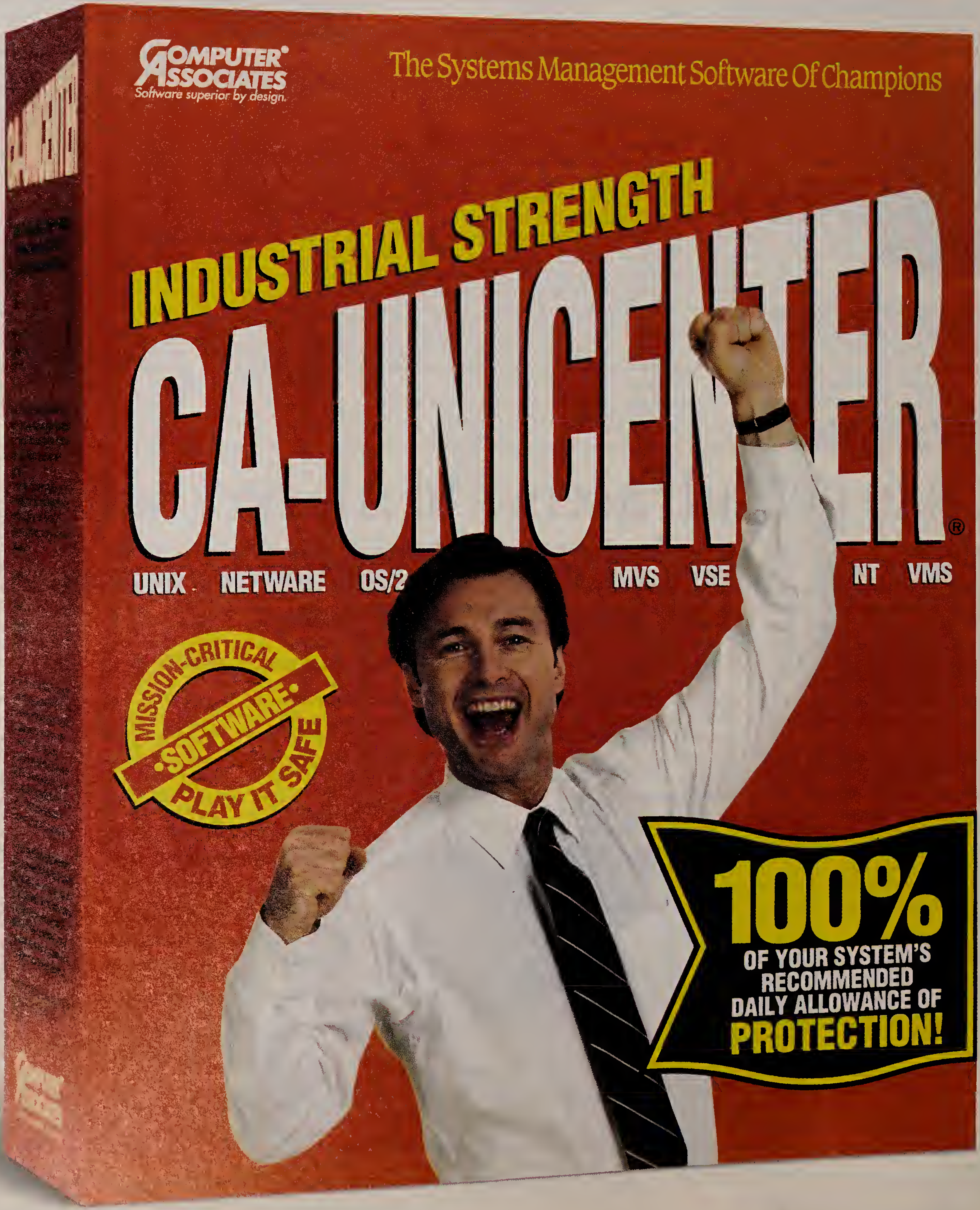
Alpha All-In-1

All-In-1 is supposed to finally get support on Digital's Alpha AXP systems line under the OpenVMS operating system in the same time frame that Version 3.1 of the software is due out with the PC scripting support, Digital's Stephen Martin said. Plans for All-In-1 also include the addition of full X.400 mail compatibility, he indicated.

Outside interest?

The set of APIs being built into TeamLinks for developing All-In-1 applications will also be made available to other software vendors, said Stephen Martin, a Digital marketing manager. He added, though, that Digital is uncertain of how much demand there would be for using the APIs and has not yet settled on a method for distributing them in the event that other companies wanted to develop All-In-1.

How To Fortify Against Other Systems Mana



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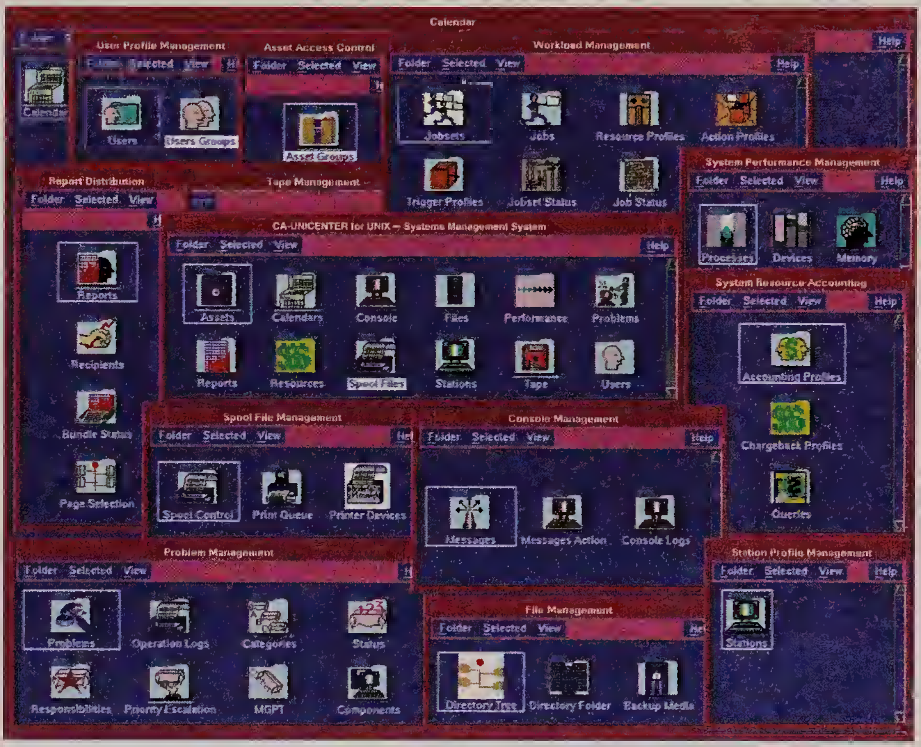

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Basics apply at database show

By Kim S. Nash

CHICAGO

Nuts and bolts products — especially tools to connect mainframe databases to Unix-based systems —were the big emphasis at the Database and Client/Server World Show early this month, as user demand grows for products that make client/server easier to implement.

But Microsoft Corp. did introduce a SQL Server database engine running on Alpha machines from Digital Equipment Corp. The product, due to ship by month's end, is priced between $995 and $19,995.

Possibly more practical, however, were products unveiled by smaller firms designed to plug gaps in client/server connectivity. Gupta Corp., Information Builders, Inc. and other database and application development firms showed new or enhanced gateways, query tools and other utilities that help users fold data housed in IBM mainframe databases into client/server schemes.

Database and related companies "are starting to wake up to the fact that to sell products in the client/server era, connectivity holes cannot be ignored," said Dan Richards, an analyst at Database Associates in Morgan Hill, Calif. Richards helps users design databases for client/server computing.

Announcements included the following:

▶ Information Builders unveiled a comarketing pact with Unisys Corp., where Unisys will resell Information Builders' Focus fourth-generation language and EDA/SQL gateway product. The goal is to entice IBM mainframe users to migrate applications to Unisys' U6000 series Unix-based hardware.

▶ Micro Focus, Inc. signed a joint distribution agreement with XDB Systems, Inc. that calls for Micro Focus to sell XDB Workbench, a testing and maintenance tool for IBM DB2 applications. Micro Focus also disclosed that IBM's workstation-level CICS technology will be added to Micro Focus compilers and other development tools.

▶ Red Brick Systems showed speed and efficiency improvements to Red Brick Warehouse database that lets users build more complex queries by using parallel processing technologies. An Open Database Connectivity driver is due out in first-quarter 1994, with versions of the warehouse for symmetric multiprocessing machines from Hewlett-Packard Co., IBM and NCR Corp. and Sequent Computer Systems, Inc.

▶ Gupta introduced SQLConsole, a graphical tool for monitoring and managing Gupta's SQLBase Server database. Among other tasks, the PC-based product monitors database performance and shows administrators where and when data bottlenecks happen and how best to resolve them. SQLConsole, which is priced at $595, replaces Gupta's SQLMonitor product. SQLMonitor users can upgrade for $100, the company said.

New Products

Prism Solutions, Inc. has introduced Prism Warehouse Manager software.

According to the Sunnyvale, Calif., company, Prism Warehouse Manager Release 3.5 extracts, integrates and moves DB2, Computer Associates International, Inc.'s IDMS and Digital Equipment Corp.'s DEC RMS legacy data to a data warehouse in a mainframe, parallel processing or client/server environment.

Prism Warehouse Manager costs $75,000.

▶ *Prism Solutions*
(408) 481-0240

Connectronix Corp. has introduced WinTronix/400, a file-transfer software module.

According to the Salt Lake City company, the product was designed to allow users to transfer data to or from an IBM AS/400 using Windows.

The product is an Advanced Program-to-Program Communications application that lets PCs, notebooks or laptop computers transfer data when the user is attached to the AS/400 through Twinax, Ethernet, Token Ring, Synchronous Data Link Control or async adapters.

WinTronix/400 costs $99.

▶ *Connectronix*
(801) 975-7477

Commentary

Thomas Hoffman

The power of one

How in the world did Unisys have such a good year selling mainframes?

Here are the mostly ugly realities of the mainframe market in 1993:

- Most mainframe vendors, including IBM and Amdahl, got battered this year.
- Users are moving in strong numbers to distributed architectures. Many are replacing their mainframes outright with nimbler and more cost-effective servers and workstations. Others are consolidating whatever mainframes they have into fewer, more powerful boxes.
- The European market, traditionally a sizable contributor to U.S. mainframe revenue, continued to wallow in the economic doldrums.

On the surface, Unisys' success doesn't make sense. In 1993, the total worldwide mainframe market, including players such as IBM, Unisys and Siemens-Nixdorf, shrank 7% to an estimated $25.9 billion from $28.1 billion in 1992, according to International Data Corp. in Framingham, Mass.

And you can't blame Unisys' success completely on the 10% annual decline of the IBM System/390 large-scale market, where Unisys doesn't really compete. While IBM and Amdahl were getting shellacked, Hitachi was having a record year, due primarily to sound product and strategy execution.

So how did Unisys, which was on the brink of financial ruin three years ago, manage to increase its 1993 estimated mainframe revenue by about 9%? Several factors came into play, including corporate America's most stunning financial turnaround since Chrysler.

The biggest contributor to Unisys' mainframe revenue growth this year was pent-up demand, particularly for its A11, A16 and 2200/500 machines. While some of that demand was product-related — users were waiting on improved processor performance, along with TCP/IP, OSI, Posix and Unix interoperability — a fair amount resulted from loyal Unisys customers who had put off their big iron purchases until the vendor became financially stable.

> On the surface, Unisys' success doesn't make sense.

With Unisys having tallied eight straight profitable quarters and counting, its big iron customer demand has followed.

Unruh influence

Since Unisys Chairman and Chief Executive Officer James A. Unruh took the helm in October 1990, the company has undergone a massive transformation, including the re-engineering of its mainframe development. The Blue Bell, Pa., vendor scrapped what had been separate development groups for its four mainframe lines and consolidated common core technology development for equipment such as consoles, power supplies and user memory into a single unit.

The results of what Unisys calls "layered engineering" are impressive: In 1990, it took Unisys 2½ years to bring a mainframe product to market from scratch. Today, it can get one out the door in less than 18 months.

Nor should Unisys' strong technical capabilities be overlooked. The high-end 2200/900 machine was brought forth with a whole new architecture, including the introduction of the Extended Processor Capability, by which users can connect up to 32 processors in parallel over high bandwidth.

The introduction of the 2200/500 marked another milestone — not just for Unisys but for the entire industry. The midrange machine was the industry's first replacement of standard bipolar emitter-coupled logic processors with lower-cost CMOS technologies.

And despite the massive cost-cutting efforts he enforced three years ago, Unruh made sure that Unisys continued to churn out high-quality products. For the fourth consecutive year, *Nikkei Computer* magazine has rated Nihon Unisys Ltd. — a joint venture between Unisys and Mitsui & Co. in Japan — the top-rated Japanese mainframe vendor, based on a survey of 5,000 Japanese big iron users. The company beat out the likes of Fujitsu, Hitachi and IBM. Closer to home, Unisys continues to score high marks in Datapro Information Services Group's annual U.S. and European mainframe user satisfaction surveys.

However, it would be misleading to say that Unisys is finally eating IBM's lunch. Most research firms place Unisys' share of the mainframe market at less than 5%, and most of the company's sales are admittedly from its own installed base.

Still, Unisys did win several major competitive bids against IBM this year, including a $25 million overhaul of the Nasdaq Stock Market's information systems, and a hotly contested mainframe pact with the U.S. Department of Housing and Urban Development. And while IBM and other plug-compatible manufacturers continue to point to financial weakness in Europe as a trouble spot, Unisys is seizing the lion's share of burgeoning Eastern European bank automation contracts. These include a $57 million deal it landed in June to automate operations at Orszagos Takarekpenztar, the National Savings Bank of Hungary.

Steady growth

So does all this mean that Unisys will set the mainframe market on its ear next year? Not exactly. Frank Brandenberg, deputy president of Unisys' computer systems group, predicts revenue growth in the 4% to 6% range, although the introduction of several new A series and 2200 systems, combined with an improving European market, could raise the figure closer to 8% or 9%.

IBM continues to undergo the mother of all transitions, and its 1994 rollout of its parallel query and parallel transaction systems have to be executed well. Amdahl's open systems diversification will require tremendous marketing execution and a retraining of its sales force, following its alliances with Sun, EDS and other forthcoming partnerships.

So who says the mainframe is dead? 1994 promises to be pretty lively, especially if Unisys maintains its current pace.

Hoffman is *Computerworld*'s Mid-Atlantic correspondent.

CASE
LANGUAGES
TOOLS

Application Development

VISUAL BASIC ALTERNATIVE, 72
NEW APPLICATIONS
ENCOURAGE ALPHA FOUR, 72

Linking of object-oriented standards limited

Interoperability pact between Digital, Microsoft does not go far enough

By Melinda-Carol Ballou

Although the gap is narrowing between two major object-oriented standards, issues remain that will take some time to resolve.

Behind-the-scenes negotiations now in progress, according to sources, could result in more general interoperability between the Object Management Group's (OMG) Common Object Request Broker Architecture (Corba) and Microsoft Corp.'s Object Linking and Embedding (OLE), but the outcome is still unclear. Microsoft denied that such negotiations are occurring.

Taking a big step

In the meantime, however, Microsoft took a large "step forward," according to industry analysts, when it announced its intention to provide interoperability between OLE and Digital Equipment Corp.'s Corba implementation [CW, Nov. 22, Dec. 6].

But observers also voiced concerns because Microsoft officials made clear that the agreement with Digital does not involve a more general Microsoft commitment to directly support the Corba standard with OLE.

Quest for technology

Twelve vendors stated their intentions earlier this month to answer the OMG's request for technology for Corba interoperability, including: IBM, the Open Software Foundation, Iona, Digital, Hyperdesk, AT&T/NCR Corp., SunSoft, Inc., NEC Corp., HP, Symbiotics, Inc., Expersoft Corp. and ICL. They will submit their proposals to the OMG in March.

As the situation currently stands, this means that compatibility between OLE objects and Corba objects must be mediated by a future version of Digital's Object Broker. Once an interoperability standard for Corba is set sometime next year and adopted by vendors, corporate developers can use Object Broker as part of the means to translate between OLE objects and other vendors' Corba implementations.

Alternately, developers could use the Digital/Microsoft Common Object Model specifications, now being defined by the two companies, to create their own connections between OLE and other Corba systems. Some of the other vendors supporting Corba include IBM with its Distributed System Object Model and Novell, Inc. with its use of Hyperdesk Corp. technology, as well as Sun Microsystems, Inc. and Hewlett-Packard Co.

The way it should be

The preferred solution from a developer's point of view would be direct interoperability between the robust object-oriented capabilities of Corba-compliant object models and OLE objects, according to some industry analysts. This would provide the flexibility to integrate a range of Corba systems directly with OLE without another layer of software to do the translation.

An on-site developer at Bellcore in Livingston, N.J., spoke enthusiastically about the potential for a connection between OLE and Corba. "OLE makes it easier to integrate applications on the desktop, and Corba will allow users to integrate applications on the fly between clients and servers on mixed platforms," said Samir Desai, a member of the tech-

Object-oriented, *page 72*

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Programming environments

Apple, Symantec rethink role Bedrock will play

By James Daly

■ **Apple Computer, Inc. and Symantec Corp. are rethinking the role of the Bedrock programming environment and casting about for a new place for what was once described as their premier platform for building PowerPC applications.**

Bedrock was designed to allow a programmer to write a single version of an application and then recompile it for Macintosh or Windows without recoding. What has thrown a monkey wrench into the plans is OpenDoc, an Apple-designed software architecture for embedding features of different applications into a single document under Macintosh, Windows or Unix.

OpenDoc was announced in June as a competitor to Microsoft Corp.'s Object Linking and Embedding (OLE) architecture and is scheduled to be available this summer.

Reevaluation

"We're reevaluating the way that Bedrock is designed to make sure that is really the way we want to move," confirmed a spokesman for Apple's Business Systems division. A Symantec spokeswoman added, "What needs to be determined is how [Bedrock] would work with technology like OLE and OpenDoc."

Specifics? Don't look for many — at least not yet. Unfortunately, neither Apple nor Symantec would get into the nitty-gritty detail about what portions of Bedrock are being reassessed or which may be reused in the OpenDoc environment. "I think that's because they are not exactly sure themselves what they need to do," said one source working with Apple. "It's a touchy issue."

Bedrock not dead

Both Apple and Symantec officials emphasized that Bedrock is not dead. A Symantec spokeswoman said Bedrock is in beta-testing and Symantec is scheduled to ship low-level foundation classes (such as those that would be required in memory management features) in the first half of 1994.

Some developers said they were concerned about Bedrock's fate. "I've heard a lot of talk, but I haven't heard many specifics," said Dave Harding, product manager for WordPerfect Corp.'s WordPerfect for the Macintosh. "We can't base critical business decisions on something that seems so uncertain."

Harding said the idea of a multiplatform development environment is a good one but that developer support is not behind Bedrock. "If other publishers are hot on Bedrock, I haven't spoken with them," he said.

Apple developers said cross-platform development platforms are critical, especially considering the financial lure of the successful Windows environment. "Apple is a realist — it has to be a realist if it's going to survive," said Jeffrey Cherniss, executive vice president at Avanti Software, Inc. in Palo Alto, Calif.

Bedrock was announced in June 1992 and originally scheduled to be released earlier this year. Apple told users that Bedrock was the successor to Apple's current object-oriented framework technology, MacApp, for PowerPC development. But that no longer appears to be the case.

Bedrock provides a common set of building blocks, or "objects," that become the basic structure for an application. Such a framework enables developers to quickly and easily create a single version of source code that can then be tailored to platform-specific versions of an application, according to Symantec Vice President Gene Wang.

Initially, Bedrock will support Macintosh and Windows, with future versions addressing other desktop platforms such as OS/2, Unix and Microsoft's Windows NT.

Separate pieces

OpenDoc, on the other hand, breaks computerized components into individual parts that can then be manipulated.

For example, many applications may have similar functions but are implemented in different ways. A text-editing capability, for instance, can be implemented six different ways on as many different programs.

OpenDoc got another boost last week, when Apple unveiled updated versions of Hypercard and AppleScript that both take steps toward the OpenDoc compound-document architecture.

Ideas that tie

In September, seven vendors (IBM, Apple, WordPerfect, Novell, Inc., Oracle Corp., Taligent, Inc. and Xerox Corp.) announced an effort to tie together a series of data-sharing technologies. The Component Integration Lab hopes to integrate OpenDoc; Bento for storing and exchanging multimedia information; Open Scripting Architecture for the coexistence of multiple scripting systems; and IBM's Systems Object Model for dynamic object linking.

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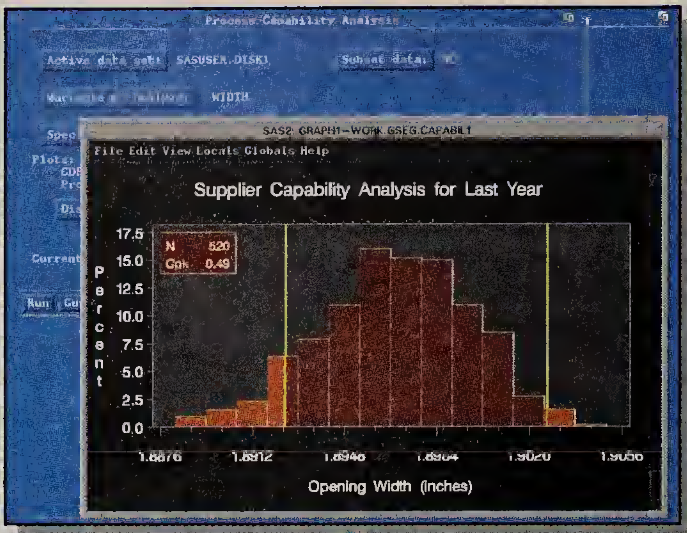
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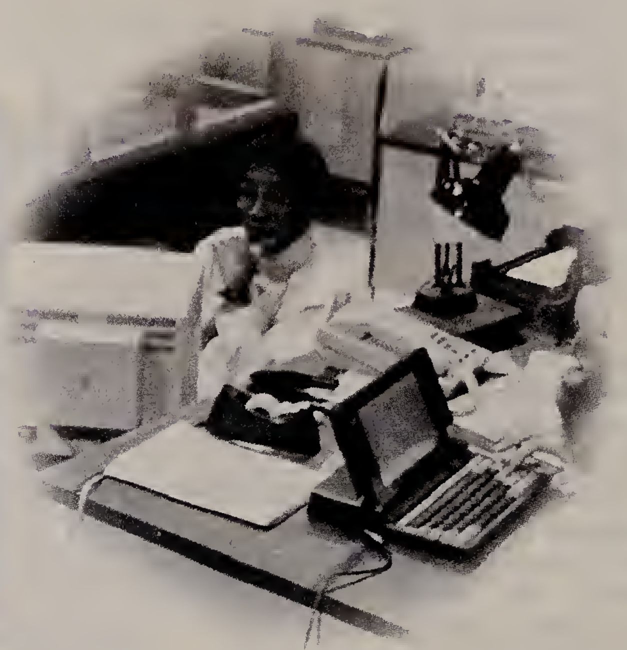

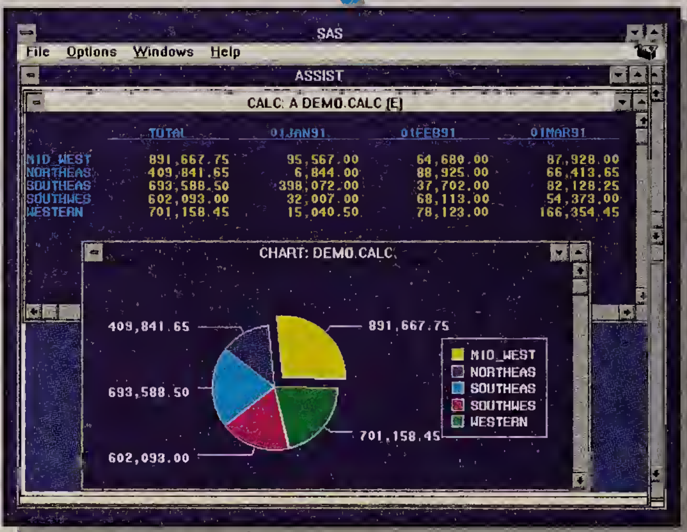

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SOUTHEAS	693,588.50	398,072.00	37,702.00	82,128.25
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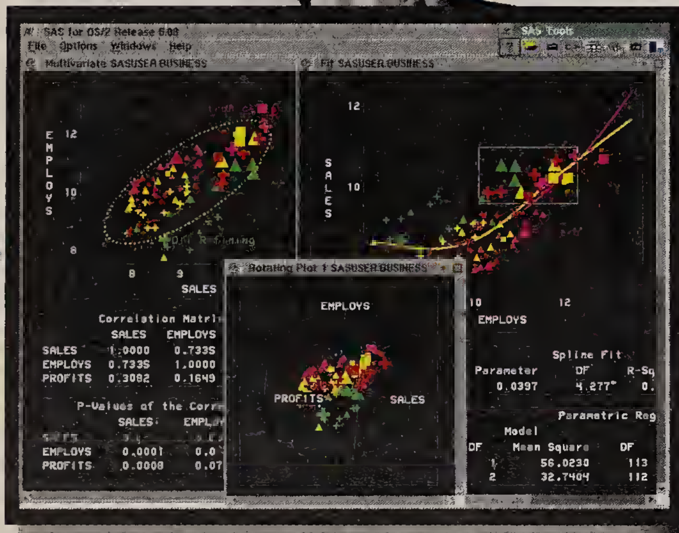
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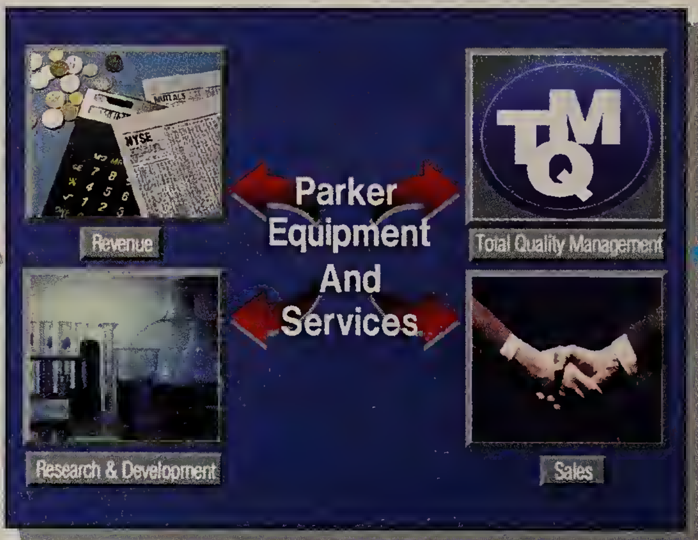

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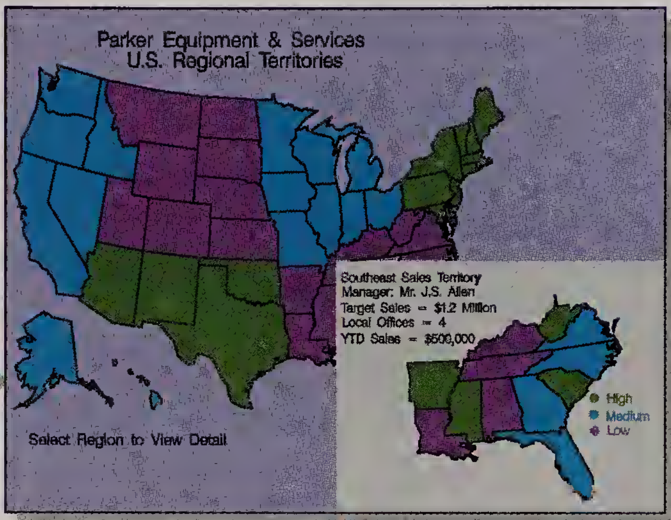
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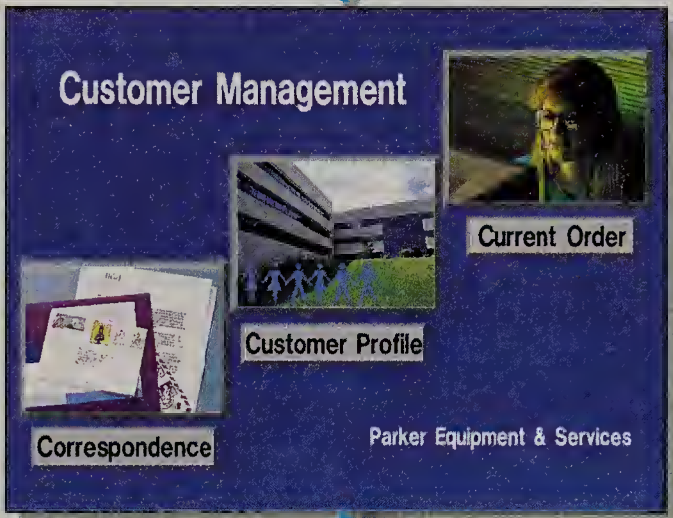

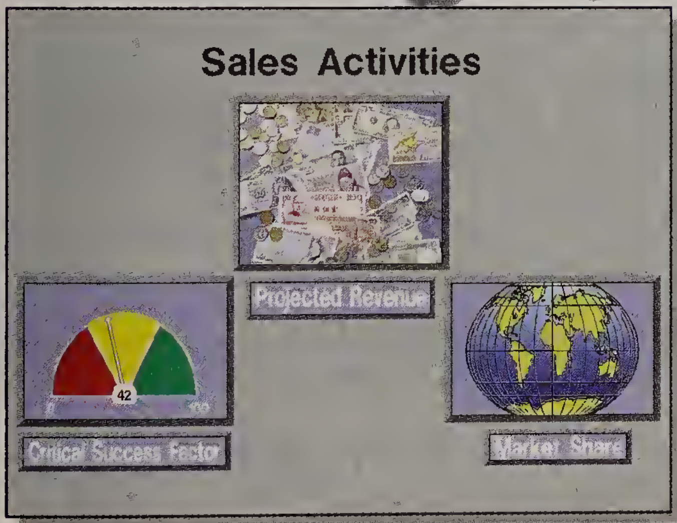

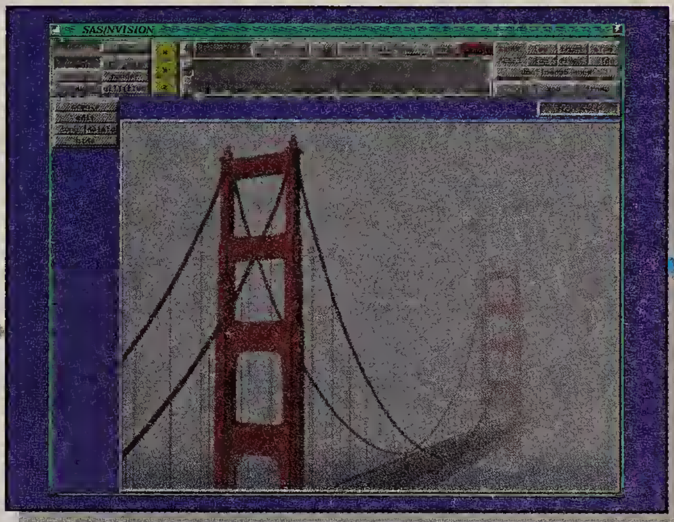

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CA-Realizer 2.0: An alternative to Microsoft's Visual Basic

PRODUCT test DRIVE CA-Realizer

By Garry Ray

If you have ever touched a programming language, you probably know of Basic. And if you have ever written a program for Windows, you probably know about Microsoft Corp.'s Visual Basic.

Less prominent than Visual Basic is another Basic development environment that was actually released before Microsoft's object-oriented version in 1991.

Called CA-Realizer, this Basic development environment from Computer Associates International, Inc. in Islandia, N.Y., was recently upgraded to Version 2.0. The new version includes enhancements of primary interest to OS/2 users and other IBM shops.

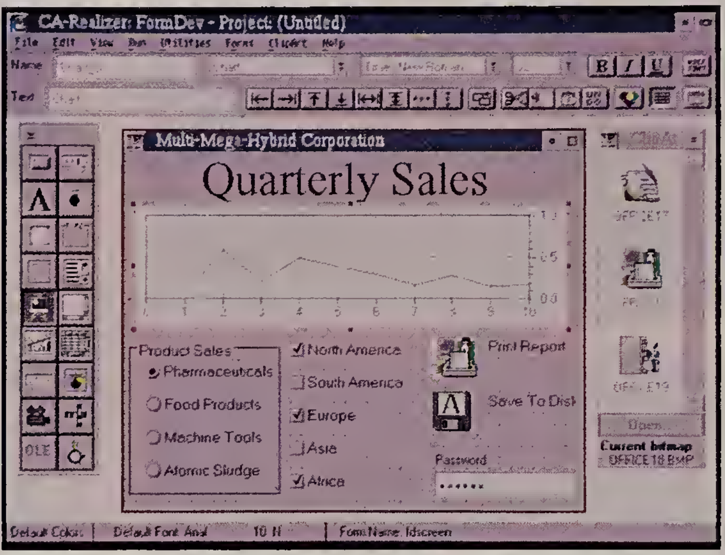
Reasons to try

But why consider any other Basic language given the popularity of Microsoft's Visual Basic? There are a few key reasons why you might do so.

First, the programming models used by Visual Basic and CA-Realizer are entirely dissimilar. CA-Realizer retains the familiar procedural model employed by most programming languages for the last 30 years. Visual Basic's event-driven programming model requires a significant jump into object-oriented thinking. That can be tough as well as unnecessary for many programming projects.

A second key reason to look at CA-Realizer is ease of maintenance. While Visual Basic programmers might argue otherwise, the event-driven model does have a vexing aftereffect. Application source code is located within multiple program objects, making programs somewhat difficult to trace and debug. For small- to moderately-size programs, CA-Realizer's procedural model is a bit easier to handle.

Finally, the new version of CA-Realizer provides a feature that Visual Basic is unlikely to duplicate: OS/2 compatibility.



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CA-Realizer 2.0 is delivered *with full OS/2 and Windows development environments*

With Version 2.0, the core Realizer package is delivered with full OS/2 and Windows development environments. Selecting the appropriate one is merely a matter of running one of two installation programs. But compatibility extends in other directions. Once a program has been written within either development environment, its compiled source code can be run under either operating system.

To make this possible, CA-Realizer includes a Dynamic Link Library and a runtime support library for both operating systems. Porting code from one operating system to the other is primarily a matter of installing these runtime files in the appropriate directory. Once done, porting is a matter of copying the compiled program files to the second operating system.

Although a number of CA-Realizer features remain essentially untouched from previous versions, they are worth mentioning.

Among the more useful Realizer features are a group of controls that can be integrated into Realizer applications. (The manual calls these "Programmable Application Tools.") Similar to Visual Basic custom controls, the Realizer controls include a spreadsheet, a text editor, business graphics and a table tool.

Less time-consuming

Any and all of these controls can be made an integral part of any application. An example is a program that collects data from a database file, loads it into a spreadsheet control and performs a series of automated calculations. Developing an experimental application using the spreadsheet and business graphics controls requires less than a half day's work. Notable is that CA-Realizer can directly read Microsoft's Excel and Lotus Development Corp.'s 1-2-3 spreadsheet files, Xbase databases (including headers) and other file formats.

To compile and deliver applications, CA-Realizer also includes a project manager that keeps track of all source code, binary and resource files and makes it easy to compile the application when complete.

Another project manager function creates complete installation disks, including the Realizer runtime files, for delivery to end users.

In all, CA-Realizer offers a great deal of breadth and utility for quick delivery of business applications. Its familiar programming model, assortment of development tools and portability make it a good choice for day-to-day development.

Version 2.0 is available from Computer Associates for $99 until March 31, 1994, and $247 thereafter.

Relational databases

New applications encourage Alpha-betizing systems

By Ed Scannell

In an attempt to bolster the momentum of its Alpha Four relational database, Alpha Software Corp. has delivered a collection of add-on applications that help inexperienced users be more productive.

The 10 applications that make up AppPacks are tailored to help nonprogrammers more easily create typical database applications, as well as give end users ideas about how to create new ones.

"The idea [behind AppPacks] is to show users how to use some of the basic building blocks within Alpha Four to create applications," said Selwyn Rabins, Alpha Software's president.

People can use the applications without modification or use them as a "learning tool" to find out more about how to do database development.

Legacy, Inc., a furniture store in Rehoboth Beach, Del., uses Alpha Four and AppPacks to track orders and maintenance histories. Systems manager John Sadler said the AppPacks make "programming functions a lot clearer." Still, he said, "some of the new features" in Version 3.0 of the database itself, which Alpha began shipping in June, "were beyond my grasp, and I couldn't figure out how to do some things."

AppPacks make "programming functions a lot clearer," said John Sadler, systems manager at Legacy.

He also makes extensive use of the application's contact management features to manage the store's vendor relationships.

Perhaps one of the biggest advantages of using AppPacks is that it lets users do various report and form designs on existing databases so they can have different views of the data. Typically, this helps users gain more insight into what their data is telling them.

Business help

Among some of the core business applications are accounts payable and receivable modules to track invoices and payments; a time and billing package to record work done for clients; a program for mailing list management; and an invoicing and inventory program to automate inventory tracking.

Another application is an Employee Records program that maintains personnel files and allows users to view all employee performance, review or salary histories.

Available now, AppPacks is priced at $39. Users can purchase Version 3.0 of Alpha Four in a single-user edition with five of the AppPack applications for $149. For users with competitive products, including FoxPro and Borland International, Inc.'s dBase, the price to switch over to Version 3.0 and five applications is $99.

Object-oriented standards

CONTINUED FROM PAGE 69

nical staff at Bellcore.

Digital officials earlier this month notified OMG of their intention to offer the technology that they are jointly defining with Microsoft as the interoperability standard for Corba 2. If adopted, the Digital technology could become the path for OLE objects to interoperate with Corba. But with 11 other companies also submitting technologies, the outcome is uncertain.

Another complication is that Digital and Microsoft have yet to make public exactly how OLE and Corba objects will interoperate.

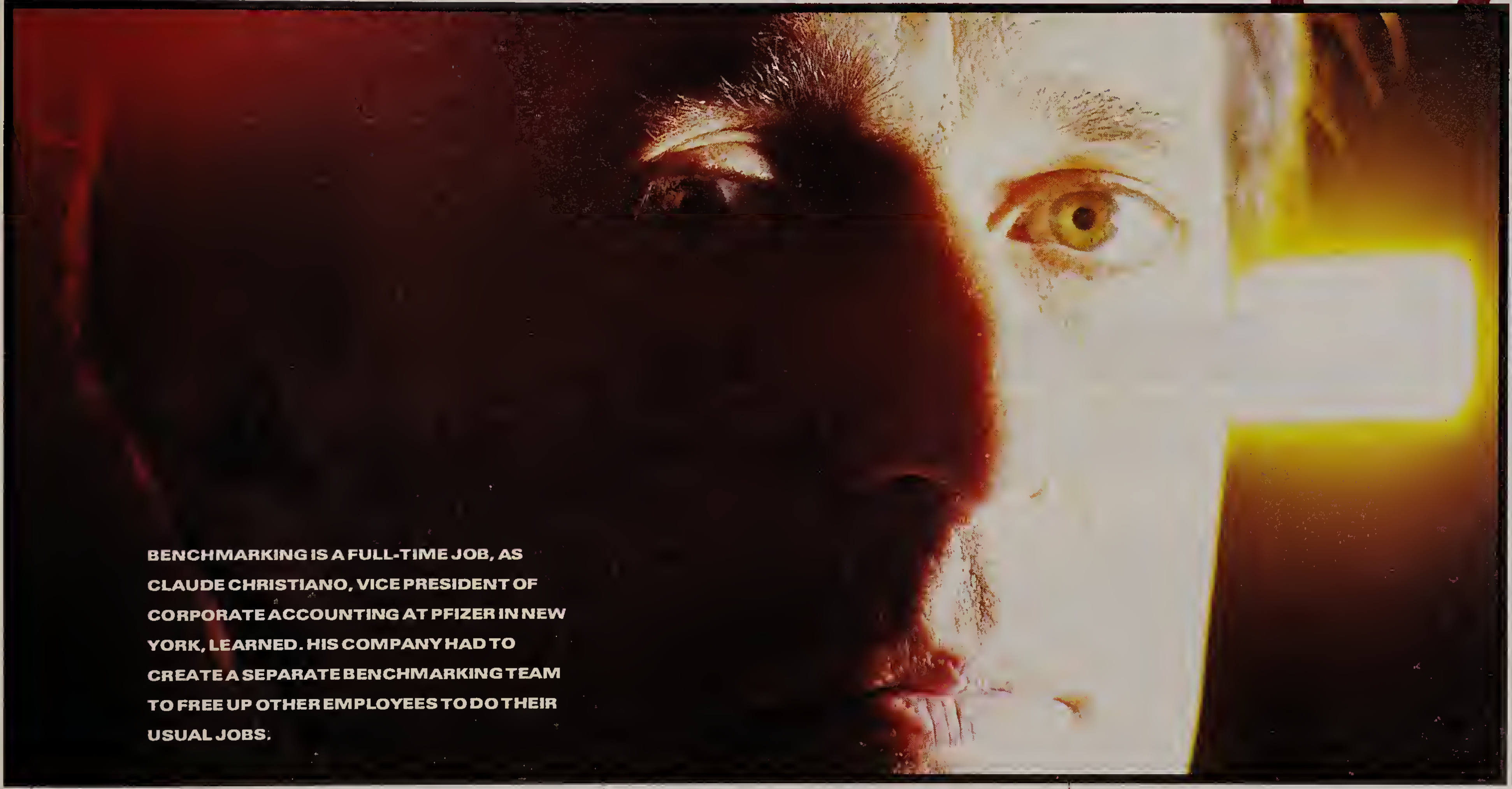
"I don't think they know yet," said John Rymer, an analyst at Patricia Seybold Group in Boston. "I think there will be a number of interoperability options that will come out of this work — from the low-level gateway option they now offer and extending all the way to a common object model, with gradations in between."

In the meantime, industry sources said discussions are continuing at the executive level between Microsoft officials and vendors, including IBM and Sun, about interoperability between other Corba models and OLE.

A Microsoft spokesman said "nothing serious" is now in the works for such a connection, but he added that it "may be something we would do in the future."

TAKE IT FROM WORLD-CLASS BENCHMARKERS: IT DOESN'T TAKE MUCH FOR BENCHMARKING TO DEGENERATE INTO MERE INDUSTRIAL TOURISM.

BENCHMARKING on empty



BENCHMARKING IS A FULL-TIME JOB, AS CLAUDE CHRISTIANO, VICE PRESIDENT OF CORPORATE ACCOUNTING AT PFIZER IN NEW YORK, LEARNED. HIS COMPANY HAD TO CREATE A SEPARATE BENCHMARKING TEAM TO FREE UP OTHER EMPLOYEES TO DO THEIR USUAL JOBS.

CHARLIE SAMUELS

BY JULIA KING

Gary Sprehe says his company's first attempt at benchmarking was a huge disappointment — and no wonder.

Inspired by the strides in quality improvement that earned Xerox Corp. the Malcolm Baldrige Award in 1989, Texas Instruments, Inc. set out to make its information systems operation run more smoothly and be more productive and less costly. The solution: benchmarking.

TI planned to base its changes on information gleaned from its benchmarking partner GTE Corp. in Stamford, Conn., which TI officials considered to have one of the best IS organizations around. But according to Sprehe, vice president of information technology at the Dallas-based company, after six or seven meetings with GTE experts, the TI team still had little idea of what changes they needed to make or even where to start.

TI had made a fundamental benchmarking error: It hadn't analyzed its own processes before benchmarking them against another company. "We didn't have an understanding of our own processes. We weren't focused." The result: "We didn't learn much," Sprehe says.

Benchmarking appears to be a "disarmingly simple technique," but there's more to it than meets the eye, says James Staker, vice president and director of the Strategic Planning Institute's Council on Benchmarking, a consortium of corporate benchmarking partners in Cambridge, Mass.

Benchmarking is the practice of learning better ways to do things from

Benchmarking, *page 74*

Benchmarking

CONTINUED FROM PAGE 73

companies that already do them better. The most important thing to know up front: The process only appears easy.

"The whole purpose of benchmarking is to find out what makes a difference. But if a company hasn't thoroughly analyzed its own processes, it can't possibly recognize what one of its benchmarking partners is doing differently," says Jim Webber, president of Omicron, a five-company consortium in Mountain Lakes, N.J., focused on IS benchmarking.

"I've turned down companies that haven't done a self-assessment," says Samuel Bookhart, formerly a benchmarking manager at Du Pont Co.'s fibers sector in Wilmington, Del., and now an independent consultant in Chadds Ford, Pa. "You're not ready to benchmark unless you know what your own problems are."

Eager to dive in head first, companies often neglect to focus their study. These "industrial tourists," as they are known in benchmarking circles, are the same companies that come away from meetings without useful information. They're also the ones that the most sought-after benchmarking partners make a point of avoiding.

One of the lessons learned by Claude Christiano, vice president of corporate accounting at Pfizer, Inc. in New York, was to provide his benchmarking partners with a list of questions he wished to pursue before each meeting.

"Otherwise, you get off the topic and start trading war stories. You have to stay on the topic because it's rare to have a whole day with a company. Usually, you get only two or three hours," he says. Pfizer is comparing notes with 15 benchmarking partners as part of a process re-engineering effort in the financial area.

People factor

Companies that have picked the wrong people in the organization to benchmark, or placed unreasonable demands on them, have also come up short of their benchmarking expectations.

Six months into Pfizer's re-engineering study, Christiano discovered that it can be impossible to benchmark and do your regular job at the same time.

"In the beginning, everybody on the project was doing process mapping, going on benchmarking trips, plus trying to do their regular jobs under the old system. Nobody had an extra seven hours a day to dedicate to re-engineering and benchmarking," he says.

As a result, everyone was working twice as hard, and it became difficult for employees to work on the benchmarking effort, Christiano says. Now, a 10-person cross-functional team, including two representatives from IS, work solely on re-engineering and benchmarking activities.

Jeffrey Jackson, a quality specialist at Pittsburgh-based Aluminum Co. of America, has reservations about including people "too close to tactical day-to-day operations" on a benchmarking team.

"It could become a job security issue. Their job could be eliminated or changed so there's an internal bias," Jackson says.

Like Christiano, he has learned that "typically, the first benchmarking team that sits down together is the wrong team. They're usually all from the same area. Until they map the processes and see who's involved, they don't have the right people," Jackson says.

Choosing the standard

Picking the right people also means picking the right companies to benchmark against.

Ironically, benchmarking against the best of the best can provide little benefit. High-performing firms are inappropriate role models for low performers.

"The practices that distinguish higher-performing organizations are almost always ineffective" when adopted by medium- or lower-performing organizations, according to a study on international quality practices conducted by Ernst & Young and The American Quality Foundation in New York and published in September 1992.

The study even found that benchmarking marketing and sales systems can have a negative impact on lower performers. Such firms will probably "find organizations on the threshold of medium performance, rather than world-class organizations, to be more helpful models," the study said.

But even when benchmarking against world-class companies makes sense, it's not always possible. Just because you want to benchmark with them doesn't mean they want to benchmark with you.

The most-sought-after benchmarking partner can be inundated with hundreds of inquiries a year. Some, like Pfizer, opt to streamline the benchmarking process by working only with a few select companies on a continual basis.

Norman Jenkins, director of quality at Baldrige Award winner Globe Metalurgical, Inc., complains that "people actually call us for our test methods that cost us hundreds of thousands of dollars to develop. We're not going to just mail you our test methods."

Following its receipt of the award in 1988, Globe Metalurgical, like all Baldrige winners, was obligated to share with other companies what it had learned about quality and how it won the award. The Cleveland-based specialty metals company, with annual sales of approximately $150 million, spent $1 million hosting seminars and making various presentations to meet its obligations as a Baldrige winner, Jenkins says.

"Now, our objective is to make a buck and not be a philanthropic quality organization to show everyone the right way to go," he says.

Willingness to change

All the benchmarking in the world won't transform a company if employees aren't willing to take the lessons of benchmarking to heart. But one point on which there seems to be some disagreement is how to motivate workers to achieve benchmarking goals.

Webber insists that achieving benchmarks should under no circumstances be tied to management firings or other personnel changes. The fear of not measuring up will kill any desire to benchmark, he says.

But AT&T has chosen to use the threat of outsourcing as an incentive. AT&T's 42 business units, which have headquarters in Morristown, N.J., have the option of go-

Benchmarking, *page 78*

HOW TO avoid the pitfalls of benchmarking

DO'S	DON'TS	BENEFIT
Quantify the dollar value of closing performance gaps identified by benchmarking.	Don't spend time and money improving a process if it will do little to boost your company's bottom line.	Putting a dollar value on benchmarks works to secure buy-in for change from top management.
Choose the best time to benchmark.	Don't benchmark when your company is undergoing a major management or computing change. Measuring performance under such conditions is impossible.	The best time is when you're planning to re-engineer an internal business process. The benchmark then provides a target goal.
Transform benchmarking insights into new processes.	Don't benchmark unless you have the economic wherewithal to implement change.	It gives you the ability to diagnose and remedy the problems.
Analyze what you learn from other companies.	Don't expect to exactly copy the best practices of other companies. Benchmarking is not a copying process.	Other companies' best practices can be synthesized and customized to work in your corporate culture.

Why benchmark?

CONSIDER THIS INCIDENT FROM THE ANNALS OF MOTOROLA

When Motorola's top executives established the company's first major quality goal back in 1981, they knew precisely what they wanted to change and to what degree. Or so they thought.

"Being run by engineers, Motorola is very metrics-oriented," explains Ken Obrzut, director of strategic programs for corporate software. "So we set a goal of tenfold improvement [in overall quality across the company] in five years."

In 1985, a year before its self-imposed deadline, Motorola knew it would meet its goals. But one big problem remained. After benchmarking with other companies the same year, "we realized we were still behind best-of-class," Obrzut recalls.

The Schaumberg, Ill.-based company then established new goals of improving a hundredfold between 1987 and 1992. After meeting that mark in 1993, Motorola set even more aggressive quality improvement goals.

The lesson learned: "No matter how good you think you are, you're not that good. If you're going to get better, you have to learn from someone who is better," Obrzut says.

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Turn the page...

Mastering project management

IS PROS ARE SEEKING AND FINDING PROJECT MANAGEMENT TRAINING PROGRAMS

BY LESLIE GOFF

Joe Kolinger knows it takes more than just a title to be a true project manager. It means being a master of a business discipline.

"Project management is more than just scheduling," says Kolinger, a project manager at Pacific Bell's systems technology division in San Francisco. "A schedule isn't worth the paper it's printed on unless you've gone through the appropriate steps."

When properly applied to information systems development, the formal steps of project management can result in lower development costs and quicker delivery of systems.

Until recently, however, the IS community has expressed little interest in the discipline of formal project management, notes Gopal Kapur, president of the Center for Project Management, a San Ramon, Calif.-based education, training and consulting firm.

But interest is growing, and so is the number of resources available for IS professionals who wish to exchange ideas and information on formal project management as it relates to systems development.

Training — often leading to professional certification — has been the emphasis of most organizations addressing project management. Examples include the American Management Institute, the Institute for Certification of Computer Professionals and, most notably, the Project Management Institute (PMI).

PMI was founded in 1969 and developed one of the early models of formal project management, including curriculum and certification guidelines. The Upper Darby, Pa.-based firm sponsors two IS-related special interest groups, one for software developers and one for telecommunications specialists (see chart).

Of the larger IS professional associations, only the Association for Systems Management in Cleveland offers a course on project management. But IS professional organizations are stepping up their involvement in formal project management. Omicron, an IS consortium in Mountain Lakes, N.J., offers a project management seminar on demand.

The Chicago Research and Planning Group (CRPG), another regional IS consortium, plans to offer project management training sometime next year. Its members named project management as one of five education tracks they are most interested in seeing the CRPG develop, according to Richard Arns, CRPG president.

A wide variety of project management courses are available from consultants and training vendors, many of whom have alliances with PMI. A number of academic programs are also available (some accredited by PMI) — through both full-time enrollment and continuing education — such as Boston University's Center for Management Development, which offers a certification program requiring completion of five seminars.

The proliferation of these resources is no coincidence. More companies are adopting formal project management techniques in response to the high costs of runaway development projects, particularly over the course of the last few years as IS budgets were

Mastering, *page 78*

ORGANIZATIONS THAT CAN HELP

ORGANIZATION	SERVICES OFFERED	FEES	CONTACT
AMERICAN MANAGEMENT ASSOCIATION 135 West 50th St. New York, N.Y. 10020	Provides project management training, including certification, for attendees who have completed three or more project management courses. Sponsors three-day introductory course for IS professionals, "Information Systems Project Management," 30 times/year across the U.S.	IS project management course: $1,150 members, $1320 nonmembers; AMA membership: $160/year individual, $550-$1,495/year corporate.	Registration: Doreen P. Waldman (518) 891-0065; membership: (212) 903-8270.
ASSOCIATION FOR SYSTEMS MANAGEMENT 1433 West Bagley Road Cleveland, Ohio 44138-0370	Cosponsors with its local chapters a three-day workshop, "Project Management & Control," aimed at analysts, programmer/analysts, senior programmers, project leaders, managers, engineers, auditors and user coordinators. Call for 1994 dates.	$820 for ASM members, $895 for nonmembers. Membership $100/year plus one-time $15 application fee for new members.	Paula Winrod, Education Services (216) 243-6900, ext. 122.
INSTITUTE FOR CERTIFICATION OF COMPUTER PROFESSIONALS 2200 East Devon Ave., Suite #268 Des Plaines, Ill. 60018	Offers certification in different specialties, including IS management, which encompasses project management. Applicants must pass a broad core exam plus two specialty exams of their choice. Exams are computer-based and administered through Sylvan Learning Centers in 220 locations across North America.	Each exam $140; study manual, $69 (no membership fees).	Carolyn DuShane, communications director (708) 299-4227.
PROJECT MANAGEMENT INSTITUTE (PMI) 130 South State Road Upper Darby, Pa. 19082	Nonprofit organization dedicated to advancing formal project management. Maintains two IS-related specific interest groups. Offers certification testing, sponsors 65+ local chapters in North America, hosts annual seminar symposium, conducts annual awards program. Offers accredited graduate education in project management through affiliations with universities across the U.S.	Each exam $140; study manual, $69 (no membership fees).	Carolyn DuShane, communications director (708) 299-4227.
PMI INFORMATION SYSTEMS SPECIFIC INTEREST GROUP (ISSIG) P.O. Box 8026 Newport Beach, Calif. 92658-8026	Aimed at PMI members involved in software development. Conducts a technical track for presentation of papers on project management in IS and a group business meeting at PMI's annual symposium. Publishes a quarterly newsletter. Distributes a database of members detailing their technical backgrounds.	$15/year (must be a member of PMI; see listing above).	Julie Wilson, co-chair/treasurer (714) 640-3489 or call PMI (see number above).
PMI INFORMATION MANAGEMENT AND MOVEMENT AND SPECIFIC INTEREST GROUP (IM&M SIG) 2700 Snelling Ave., MS #S075 St. Paul, Minn. 55113	Aimed at PMI members involved in all areas of telecommunications. Conducts a technical track for presentation of papers on project management in telecommunications and a group business meeting at PMI's annual symposium. Publishes a quarterly newsletter. Developing a benchmarking process that establishes standards for project management in telecommunications.	$15/year.	Wade Stome, membership (619) 588-9380. Send annual dues to Larry Simonson, treasurer, at address listed at left.

FIVE STEPS TO PROJECT MANAGEMENT

1. Assess scope
2. Plan
3. Estimate
4. Schedule
5. Track

Joe Kolinger, a project manager at Pacific Bell's systems technology division in San Francisco

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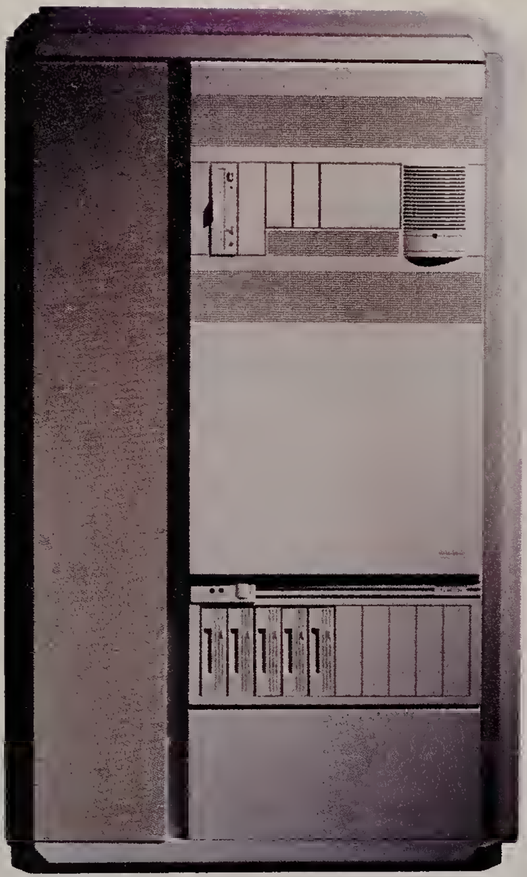

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* International Data Corporation,
"Data General's Ascent in the UNIX Market," October 1993.
** "The CW Guide to Servers," Computerworld, March 22, 1993
*** "Clash of the Drive Arrays," PC Week, October 11, 1993
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Benchmarking

CONTINUED FROM PAGE 74

ing to an outside provider for services such as payroll processing if the company's own accounting department doesn't meet prescribed benchmarks within five years after they are set.

"This puts an incentive on providers of services," says Tom Heslin, manager of benchmarking and comparative analysis for finance. So far, he says that all of AT&T's financial processes have cut costs and reduced personnel as a result of benchmarking.

Alcoa has chosen to use carrots instead of sticks: It has made dramatic gains by tying benchmarking targets to performance pay increases for managers as well as unionized and nonunion employees.

In 1991, managers were directed to choose several benchmarks and then were given two years to close existing gaps by 80%. Employees and managers were eligible for large bonuses, up to 22% of base pay, if they met Alcoa's benchmarking goals.

"The result was that most businesses have been able to close the gap," Jackson says.

What's the bottom line when it comes to avoiding the hidden dangers of benchmarking? Take a tip from Ken Obrzut, director of strategic programs for corporate software at Motorola, Inc. in Schaumburg, Ill.: "Everyone wants to know 'What's in it for me?'" Without proper preparation and incentives, your benchmarking experience can resemble the aimless ramblings of a tourist without a road map.

King is a free-lance writer in Ridley Park, Pa.

Mastering

CONTINUED FROM PAGE 76

hit by the recession. "The cost of software development is too expensive to continue to exist as we know it," Kolinger says.

"To get control of our growing portfolio of critical projects that will help us turn a profit, we have to cut down on rework, learn better how to do things right the first time, learn better how people can be most efficient and spend time on the stuff that counts," he says.

Kolinger, whose company offers internal and external project management training, says the implementation of project management techniques may be essential to the longevity of any IS staff.

With more control over their work, employees will be more satisfied with their own jobs and the work environment — and that is a major victory in itself.

"Frankly," he says, "lots of people are getting burned out. One thing that motivates me is that I'm tired of the tyranny of runaway projects and what they do to people's lives, let alone the company."

Goff is a free-lance writer in New York.

Must-reads for project managers

ESTIMATING MIS PROJECTS by Gopal Kapur, Center for Project Management, San Rafael, Calif., $79. Details algorithms and processes behind task-based estimating and uses exercises and anecdotes to analyze both successes and failures in project estimating; available from the Center for Project Management, 1 Annabel Lane, Suite 108, San Ramon, Calif. 94583 (510) 275-8000.

IMPLEMENTATION OF PROJECT MANAGEMENT by Linn C. Stuckenbruck (Addison-Wesley, Reading, Mass., 1981) $37.95. Outlines project management techniques; available from the Project Management Institute (see chart page 75).

THE MYTHICAL MAN-MONTH: ESSAYS ON SOFTWARE ENGINEERING by Frederick P. Brooks Jr. (Addison-Wesley, Reading, Mass., 1975) $23.75, paperback. Classic source on project management concepts written by former IBMer following a runaway development project.

PROJECT MANAGEMENT by Dr. Harold Kerzner (Van Nostrand Reinhold, New York, fourth edition 1992; originally published 1979) $54.95. Outlines basic project management concepts.

Calendar

JAN. 16-JAN. 22

Storage & Interfaces '94 International Technology Conference. Santa Clara, Calif., Jan. 19-27 — Nine separate but related forums and seminars will be offered during these dates. Contact: Technology Forums, St. Peter, Minn., (507) 931-0967.

Client/Server Conference & Exposition. San Jose, Calif., Jan. 18-21 — Contact: CMP Conference & Exhibit Group, Manhasset, N.Y. (516) 562-7460.

NOMDA/LANDA Emerging Technologies Expo '94. Orlando, Fla., Jan. 20-22 — Contact: National Office Machine Dealers Association/Local Area Network Dealers Association (NOMDA/LANDA), Kansas City, Mo. (816) 941-3100.

Re-engineering: The Implementation Perspective. Boston, Jan. 19-21, also to be offered Feb. 9-11 — Contact: Hammer and Co., Cambridge, Mass. (617) 354-5555.

JAN. 23-JAN. 29

Demo '94. Palm Springs, Calif., Jan. 23-26 — Features new products. Contact: InfoWorld Editorial Events, San Mateo, Calif. (415) 312-0545.

ComNet '94. Washington, Jan. 24-27 — Focus will be on companywide issues. Sponsored by *Computerworld* and *Network World*. Contact: World Expo Corp., Framingham, Mass. (508) 879-6700.

Fourth Annual "Achieving Quality Software" Tutorial and Conference. San Diego, Jan. 26-28 — Speakers include Barry Boehm, University of Southern California, and Ron Radice, director of the Software Process Program. Contact: Vince Heald, Beck-Eilman Agency, La Mesa, Calif. (619) 469-3500.

10th International Conference on Engineering Information Systems: Product Data Management & Alternatives. Dallas, Jan. 26-28 — Contact: Management Roundtable, Boston, Mass. (617) 232-8080.

JAN. 30-FEB. 5

14th Annual Florida Educational Technology Conference. Tampa, Fla., Jan. 31-Feb. 4 — Contact: Bureau of Educational Technology/Florida Education Center, Tallahassee, Fla. (904) 488-0980.

Executive Technology Summit '94. Sponsored by The Society for Information Management and *Computerworld*. Tarpon Springs, Fla., Feb. 2-4 — Contact: ATI Travel Management, Chicago, Ill. (312) 644-6642.

FEB. 6-FEB. 12

Building Enterprise Architectures. Washington, Feb. 8-10 — Contact: Technology Transfer Institute, Santa Monica, Calif. (310) 394-8305.

FEB. 13-FEB. 19

Sigda: Workshop on Field Programming Gate Arrays. Berkeley, Calif., Feb. 14-15 — Contact: Association for Computing Machinery, New York, N.Y. (212) 944-1318.

The Sixth Annual Software Support Conference. San Francisco, Feb. 14-16 — Contact: Jan Rosenthal, Institute for International Research, New York, N.Y. (212) 661-3500.

Mobile World. Dallas, Feb. 15-17 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Distribution/Computer Expo '94. West Irvine, Calif., Feb. 16-17 — Contact: C. S. Report, Uwchland, Pa. (215) 458-6410.

Concepts '94. Orlando, Fla., Feb. 16-19 — Contact: Graphic Arts Show Co., Reston, Va. (703) 264-7200.

FEB. 20-FEB. 26

Share Winter 1994. Anaheim, Calif., Feb. 20-25 — Contact: Share, Inc., Chicago, Ill. (312) 822-0932.

Documation '94 Conference & Exposition. Los Angeles, Feb. 21-25 — Contact: Graphic Communications Association, Alexandria, Va. (703) 548-2867.

MacFair '94. New York, Feb. 26 — Contact: New York MacUsers' Group, Inc., New York, N.Y. (212) 473-1600.

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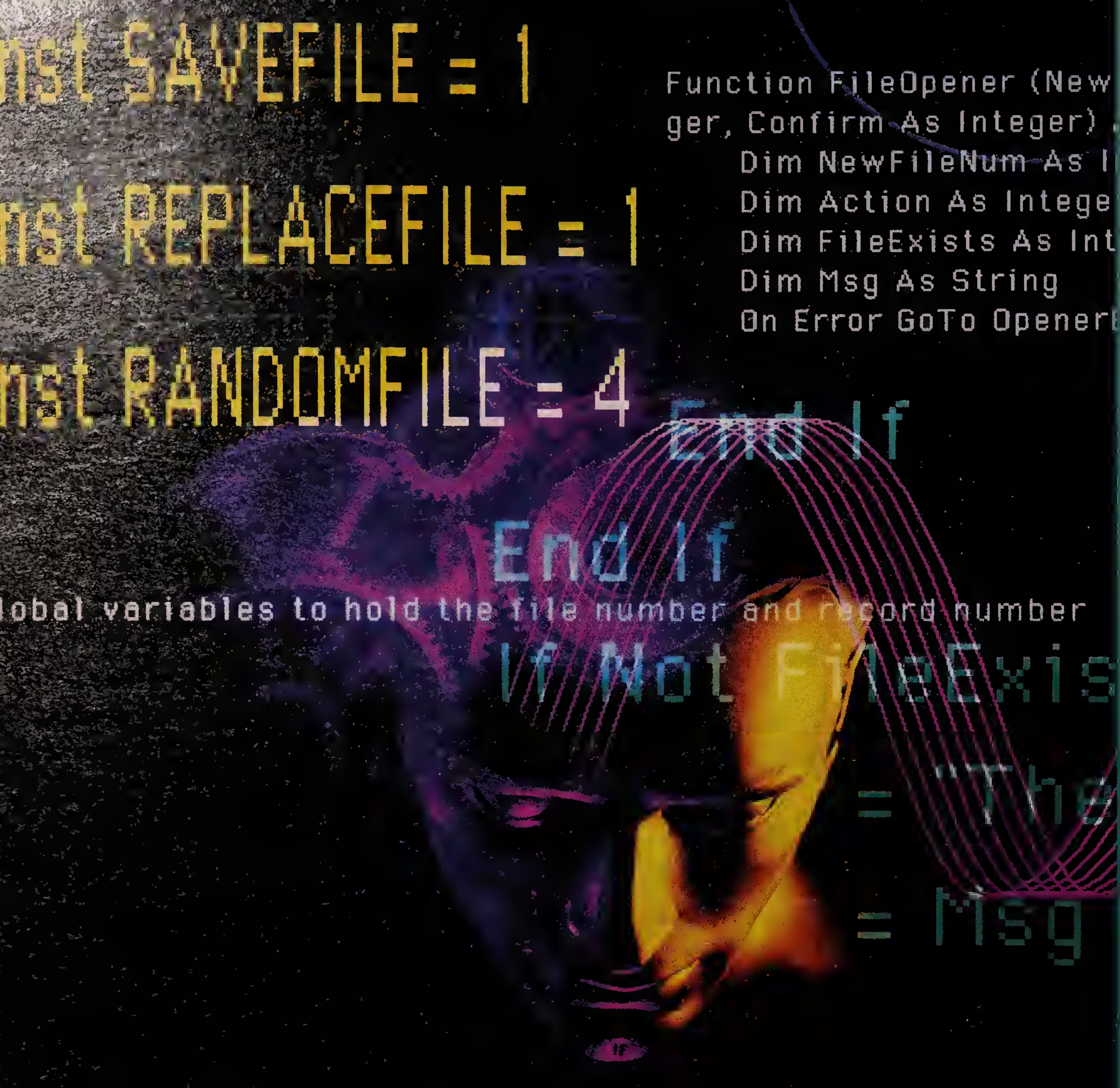

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DIRECTORY OF 1993

IN DEPTH ARTICLES

January

1•18 How to avoid client/server implementation mistakes. By Shaku Atre and Peter M. Storer

1•25 Interview with David Kahaner, senior scientist at the U.S. Office of Naval Research. By David Kellar

February

2•1 Making sense of client/server development tools. By David Baum

2•8 Revealing talk about why outsourcing partnerships sour. By Louis Fried

2•15 Companies could use a good performance review process. By Dan Allen

2•22 Business uses for the Internet. By John S. Quarterman

In Depth

HELP

Windows is driving me nuts!

March

3•1 IS in Japan. By Lori Valigra

3•8 Industry VIPs and users offer IBM advice on how to fix itself. By CW staff

3•15 Do vendors' internal IS staffs practice what the companies preach? By CW staff

3•22 The lowdown on the biggest threats to corporate data security. By James Daly

3•29 Three award-winning organizations prove you can bring IS to bear on business with spectacular results. By Julia King

April

4•5 Pushing for software that influences the way managers work. By David Vaskevitch

4•12 What's new in configuration management. By H. Ronald Berlack

4•19 Situations in which client/server doesn't work. By Michael Kennedy and Andrew Gurbaxani

4•26 Preparing your network for client/server. By James A. Hepler

May

5•3 An excerpt from the book *Reengineering the Corporation.* By Michael Hammer and James Champy

5•10 Interview with Doug Lenat, a scientist programming common sense into computers. By Glenn Rifkin

5•17 To keep up with technology, IS has to adapt to continual learning and rely more on users. By Michael S. Howard

5•24 1994 is a watershed year for wireless networks. By J. Gerry Purdy

5•31 The scoop on rapid application development. By W. Burry Foss

June

6•7 *Computerworld* Smithsonian Award nominees. By CW staff

6•14 Object DBMSs aren't superior to relational DBMSs. By Fabian Pascal

6•21 Outsourcers and end users are threatening your job. By Tom O'Connor

6•28 How re-engineering affects IS, end users and business managers. By Julia King

July

7•5 Interview with Bonnie John, a crusader for user-centered systems design. By Lory Zottola Dix

7•12 Interoperability is still a pipe dream. By Dan Lynch

7•19 What applying for a quality award means in terms of IS effort. By Julia King

7•26 Beyond decision support. By Edgar F. Codd, et al.

August

8•2 The content challenge: making strategic use of business information embodied in software. By Esther Dyson

8•9 Former PC retailers are keying in on service and support. By Gilles Guignat

8•16 The convergence of TV and computers and its affect on jobs. By David Baum

8•23 The heat is on to make advanced tech work more relevant to the business. By Ellis Booker

8•30 Training and support are becoming embedded in systems. By Lance E. Dubin

September

9•6 The date change in the year 2000 could wreak havoc on systems. By Peter DeJager

9•13 Windows is driving me nuts! By Brien C. Boland

9•20 What's wrong with IS. By Larry Runge

9•27 Local government tech chiefs struggle to survive. By CW staff

October

10•4 Client/server isn't all it's cracked up to be. By Joe Panepinto

10•11 Mission-critical wireless LANs that get neglected. By Kevin R. Sharp

10•18 A minorities status report. By Julia King

10•25 Bill Gates and Steve Jobs have a lot in common. But they don't have to be nice to each other. A book excerpt. By Randall E. Stross

November

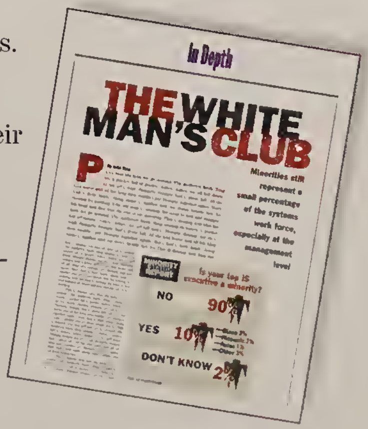
11•1 Soundoff: Are offshore coders a remedy or ruin? By Steven E. Kruse and Louis J. Buonincontri

11•8 Internetworking tales from the trenches. By Joanne Cummings

11•15 Soundoff: Should end-users develop their own applications? By Jeff Papows and Joe King

11•22 The downside of massively parallel processing systems. By Andrew Boughton

11•29 What it's like to be a beta site. By Kim S. Nash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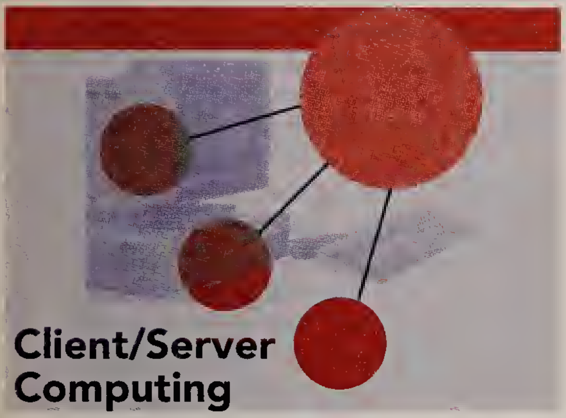

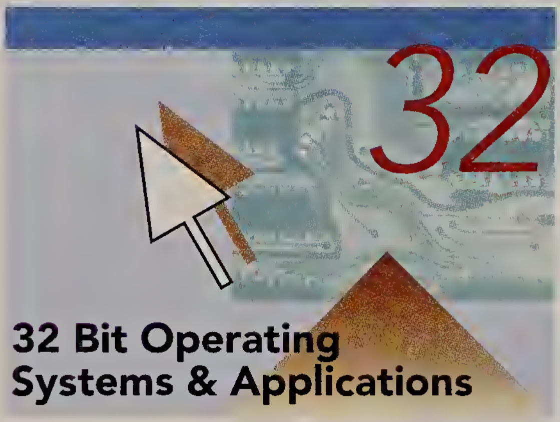

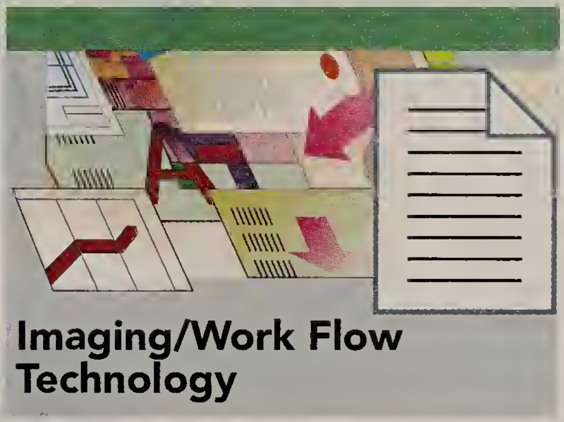

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HOT managers play it cool

IS staffs respect technical proficiency but want managers with a hands-off approach

KEEPING UP

By Julie Hart

Without a doubt, most information systems professionals — management and staff alike — agree that middle managers need to stay abreast of technologies to be effective managers.

"Any professional manager in information technology that doesn't stay current won't succeed," says James F. Sutter, vice president of corporate IS at Rockwell International Corp. in Seal Beach, Calif.

This doesn't mean, however, that a working knowledge is required. In fact, in many cases, direct reports want their managers to steer clear of hands-on technical tasks and maintain a purely conceptual understanding of technology.

Knowing the issues

"I don't do programming, but I can if I need to," says Ed Smith, systems manager at American Express Travel Related Services Co. in Fort Lauderdale, Fla. Instead, Smith concentrates on providing his 12 programmers with the resources they need and removing any roadblocks. "What's most important for me as a manager is to know the issues so I can address them," he said.

Still, managers say you should not rule out detail-level knowledge altogether. For instance, Joe Podolsky's staff at Hewlett-Packard Co. in Palo Alto, Calif., recently built a set of client/server applications. When a debate arose regarding the division of modules between server and client machines, Podolsky's working knowledge of client/server technology helped move development ahead.

"I examined various data models and made suggestions," says the planning and quality manager. Podolsky also offered advice on the cost of data transmission over the network, pointing out potential savings. Ultimately, the programmers agreed on a solution and completed the project.

Hank Taylor, network services manager at HP, heads a group of 300 people dedicated to developing and providing network services such as voice, data and electronic data interchange.

While Taylor requires his management team to stay current on technical issues, he doesn't expect them to perform technical duties such as network reconfigurations or programming. "As you go down in an organization, the technical skills get stronger," Taylor says.

Understanding technology

Smith says this approach is becoming more prevalent at American Express. "Because we give our staff the ability to empower themselves, we trust that they know what they're doing [technically]. My job is to lead my staff. To do this well, it's important that I have an understanding of the technology they're working with."

To keep up in a fast-paced environment, Smith relies on his group's training department, which offers technical managers custom courses that provide an overview of specific technologies, rather than hands-on training.

For example, Smith can take courses in Information Engineering Facility, DB2, PCs and client/server. His staff attends more detailed versions of the same courses.

Beyond workshops and trade magazines, managers say their staffs are the most important resource for keeping up with technology.

"I don't handle hands-on troubleshooting or development," Sutter says. "My managers typically don't either, but I expect them to be as current as possible in their area of management. If you stay close to your staff, you'll stay close to the issues."

Hart is a free-lance writer in Santa Clara, Calif.

OPINIONS FROM THE RANKS

DIRECT REPORTS WANT A COACH, NOT A TECHIE

> "My boss has a lot of technical skills, and that's helpful. I can't see someone who has never programmed before managing a technical department. If we get stuck we can go to him, but he doesn't tell me how to do my job. His biggest job is telling us how to prioritize our tasks."

REGENA SMITH, PROGRAMMING AND OPERATIONS COORDINATOR, CITY OF TEMPE, ARIZ.

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JOB Defense

By Leslie Goff

If you can't justify your job, you had better learn to. Any information systems position is subject to review, and the hardest jobs to make a case for are those that don't make an immediate, visible impact on the bottom line.

Positions often perceived as overhead include systems planner, advanced technologies researcher, standards planner and IS trainer. These jobs are critical to maintaining effective service levels but their value to the company is difficult to communicate.

Defending your position

"In IS, jobs are somewhat more difficult to defend than in other areas because they are positions that not everyone understands," says Robert M. Rubin, vice president of IS at Elf Atochem North America in Philadelphia and president of the Society for Information Management.

Most often, managers are the ones who must defend a position, but many agree that it's a two-way street. IS staffers must be willing to assume responsibility at lower levels within the company and prove their own value through hard work. "The days of having staff who just wait to be told what to do are gone," says Bob Cerny, manager of advanced development at Elkay Manufacturing Co. in Oakbrook, Ill. "We need people who are self-starters, who will go out and determine what needs to be done and do it."

Moreover, staffers must develop the skills that make them indispensable. Don Tabler, an advisory systems planner at IBM's Integrated Systems Solutions Corp. in Chicago, says IS staffers were nervous when his former employer, Continental Bank Corp., announced it was evaluating bids to outsource its IS function. Continental's chairman told them to "do whatever makes you marketable, and you will always have a job," Tabler recalls. "After that, when the bank asked me to do something, I would evaluate whether it would make me more marketable," Tabler says. "Sometimes I would say no to things like working with older technologies that were not particularly valuable anymore."

Now Tabler serves his former employer as part of ISSC's outsourcing service. He is developing OS/2 applications and helping to develop the company's network.

What's your contribution?

Both staff and management must understand how a position contributes to the bottom line and find ways to communicate that to business management. One approach is to be prepared to explain the consequences of not having the position in place, Rubin says. This strategy works particularly well for defending systems planner and advanced technology research and development positions.

Cerny says he justifies research and development staff by creating a picture of what the company would look like after a few years without them. "I can assure you that our competitors are looking at what will come out in five years and, if we're not equipped to be on top of that, they will be," he says. "People looking at what's in the labs today are cogitating how we can use it in the future."

Good offense is best defense

Taking the tack that the best defense is a good offense, Dorothy Deran, director of IS development at Syntex Corp. in Palo Alto, Calif., says she tries to justify IS positions within the context of each project estimate she delivers.

Deran, who is also president of the Data Processing Managers Association, says project estimates share a common problem in that they cover what is needed to build a system but seldom take into account what is needed to support it. "I try to identify [positions] as part of the baseline support required to keep the project and the applications current with the business environment."

For instance, it may be difficult to convince management that IS needs a dedicated training staff if a corporate training department is in place. However, IS trainers may be essential to effective baseline support.

Keeping statistics

Another part of a good offense is to keep statistics whenever possible, Rubin says. For instance, his IS staff includes a position responsible for IS contract negotiations and evaluations. The job involves researching industry pricing trends and keeping current with past contracts.

"We can document the amount of money we save by going back through our contracts, and this person has saved us a tremendous amount of money," Rubin explains.

The final word on making an IS position pertinent to the corporate bottom line, Rubin says, is to always ask yourself the hardest questions and be prepared to answer them. "It's like a baseball player swinging a leaded bat in the on-deck circle," Rubin says. "When he gets up to the plate, the real bat seems pretty light."

Goff is a free-lance writer in New York.

OFFENSIVE Strategy

If your job is under scrutiny, be prepared to prove that it contributes to the company's bottom line.

- Develop a picture of what happens when the position is eliminated.
- Identify the trade-off to management in concrete terms.
- Keep track of how much money you save the company.

ROBERT M. RUBIN, vice president of IS at Elf Atochem North America in Philadelphia, recommends using an example similar to the following when preparing your case:

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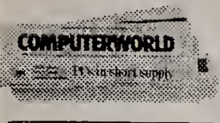

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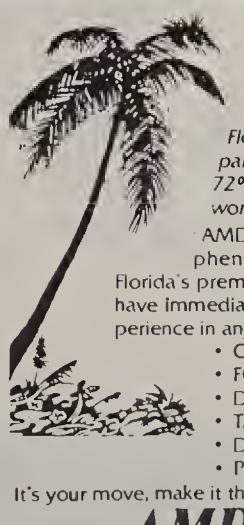

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Nielsen Media Research, the leader in the television ratings industry and a dynamic division of the Fortune 500 Dun & Bradstreet Corporation, relies on innovative technology and information collection systems to provide complex and comprehensive audience measurement data. Continued growth has created several new opportunities to join our accomplished staff at our Florida headquarters:

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You will select/create software tools that support the design and implementation physical databases in a relational DB environment. We require 5-10 years of experience in systems development and 3-5 years in database administration. Knowledge of current database design and management software tools is essential. Experience with Sybase and PowerBuilder is a plus. A BSCS or related degree is necessary.

APPLICATION TECHNICAL SPECIALISTS

Positions are available for individuals with the following experience:

- Team Leader with experience in PowerBuilder/Sybase, GUI design.
- 1-2 years experience with "C", SQL, AWK. Minimum experience with PowerBuilder a necessity.
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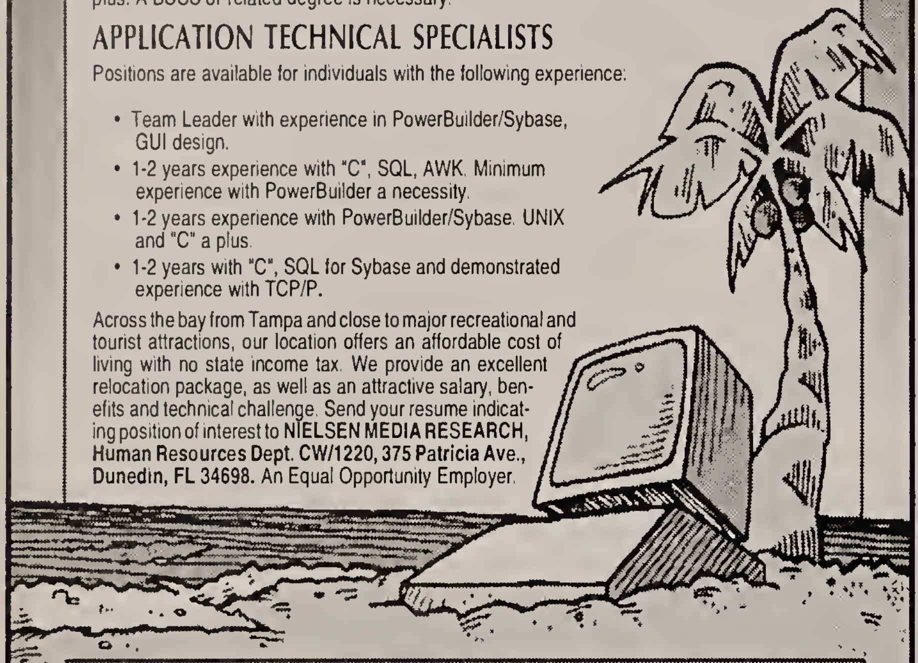

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Responsible for software tools required for system integration which include test data bed interface, simulators and automated test tools. Analyze requirements, purchase, install and maintain commercial tools, if available, otherwise, design, construct and maintain software tools; provide user manual for use of tools. Modify software to support new requirements, train team members in use of software tools. Design and populate data bed for simulators; provide documentation for usage of simulators and test data bed. Statistic analysis of data traffic generated by simulators for performance and load tests. Set up and test network connections between systems. Backup system and network management which includes set up software and document control procedures, set up, test and system configurations and resolve users' system and network problems. Education Required: Master of Science in Physics or Mathematics. Experience Required: 5 years as a Research Associate/Research Assistant and must include construction, installation and maintenance of hardware/software systems; integration testing of application systems; analyzing, designing, construction, maintenance and documentation of integration customized tools; analyzing, designing, construction, implementation and documentation for data base conversion. Starting salary is $5,056 per month. Apply at the Texas Employment Commission, Dallas, Texas, or send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778, J.O.# TX6862076. Ad Paid by An Equal Opportunity Employer.

Consultant, 40hrs/wk., 9am - 5pm, $44,000/year. Development, implementation, testing and maintenance of advanced software applications for business clients. Projects include: graphical user interface (GUI) using C++; data conversion from mainframe to UNIX, networking; shell programming. Tools: SOLARIS; TCP/IP; C/UNIX; POWERBUILDER; SYBASE; X-Windows/Motif; Shell programming; SUN workstation; ORACLE; ACCELL/UNIFY. M.S. in Computer Science as well as six months experience as a Consultant or Systems Analyst required. Previous experience must include: GUI design using C++; C; UNIX; X-Windows/Motif; Sybase; networking using TCP/IP protocol; ORACLE; Shell programming; ACCELL/UNIFY. Send resume to: Job Service of Florida, P.O. Box C, Clearwater, FL 34618-4090, Re: Job Order #FL-0946293.

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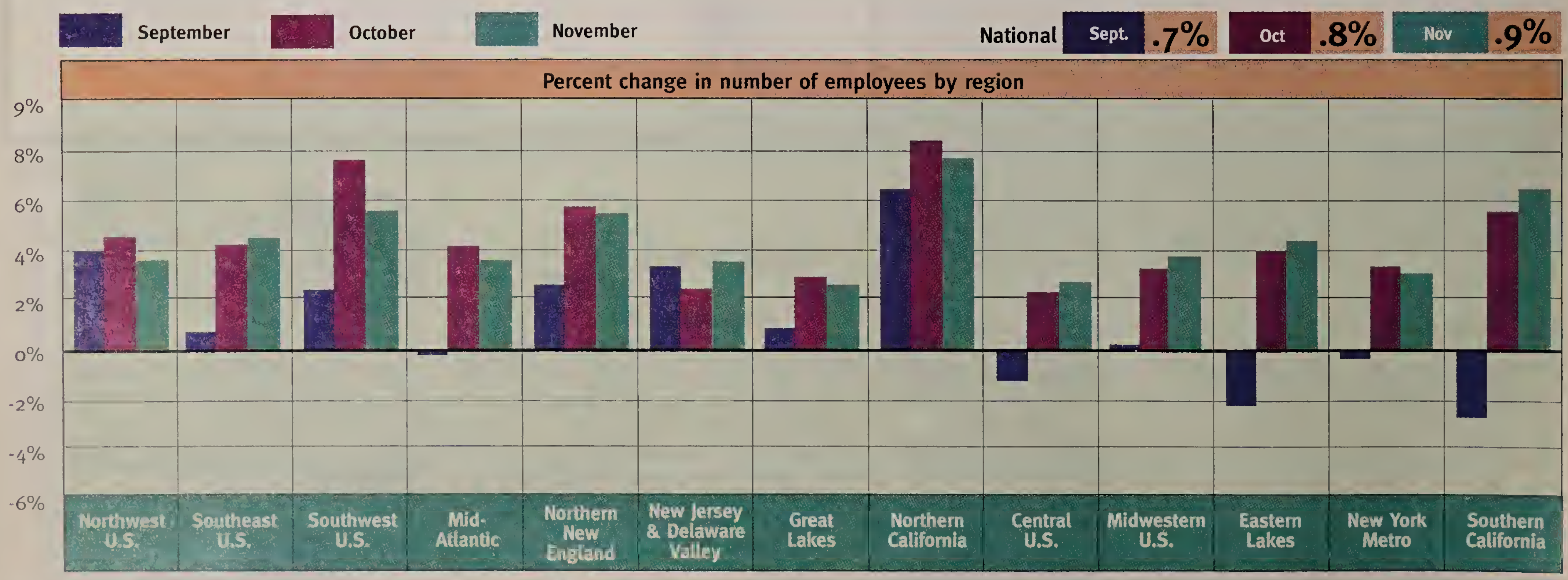
Computerworld/CorpTech Career Index

For most regions, September showed the lowest percentage change in employees



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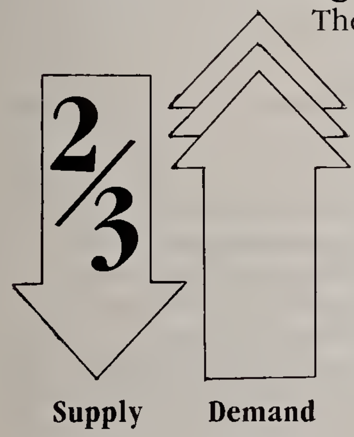
A few important tips on recruiting computer professionals

Finding computer talent isn't as easy as it used to be. In fact, there was a time when you'd just run an ad in the local newspaper and you could make a hire without waiting too long or spending too much.

But times have changed. And like so many facets of today's business, so has the effectiveness of traditional recruiting methods.

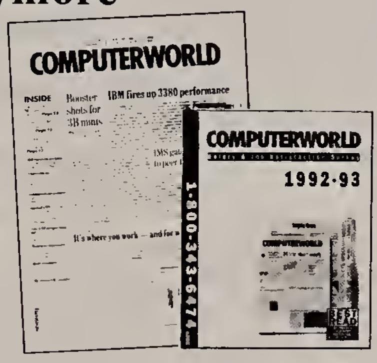
What's more, many of today's recruiters *don't use* today's most efficient methods — methods that save time and money for some widely unknown reasons.

The supply of qualified professionals isn't meeting demand



The American Council on Education reports that the number of college students choosing computer careers is down two-thirds since 1982. To make matters worse, there are more computers in today's business that require the skills of this shrinking market than ever before. And while you may never consider the company next door your competitor, it likely *is* competing for the same computer talent today. The result is a classic supply/demand problem that isn't changing for the better -and that's sure to make your recruiting tougher in the '90s.

Ads in local papers don't reach your major hiring market anymore



That's because they generally reach "active" job seekers — those who actively seek out the local newspaper to find jobs — and who a recent *Computerworld* job satisfaction survey found to represent 2 in 10 of today's computer professionals. The study also found that 7 in 10 of today's computer professionals are "passive" job seekers — those who would *consider* new job options, but likely never look for them in the local newspaper. (The remaining small percentage are "non-movers" content with long-term jobs.)

In short, this means that your ad in today's local newspaper reaches no more than 20 percent of today's computer job seekers. What's worse, if you're not using other vehicles that reach far more job seekers, your local newspaper expenses are as inefficient as their limited audience.

For every 10 of today's computer job seekers . . .
2 are Active ☐☐
7 are Passive ☐☐☐☐☐☐☐
1 is a Non-mover ☐

More job seekers see your ad in Computerworld than in any other newspaper — Sunday, daily, or trade

That's because *Computerworld* reaches over 629,000 qualified computer professionals every week — the largest audience of its kind, and one that's rich with passive and active job seekers.

That's why more companies advertise more jobs in *Computerworld* than in any other professional newspaper. And why *Computerworld* is the *single place* where America's computer professionals *expect* to see the most jobs every week.

Computerworld gives you regional editions

A key option when you need a regional candidate and want to avoid national response and relocation. Yet if your search is national in scope, *Computerworld* can also give you more widespread national exposure than any other source.

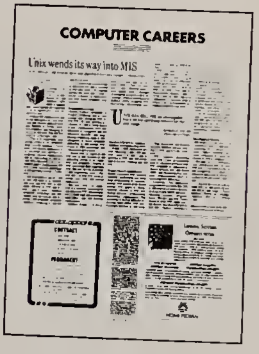
Computerworld needs just 2 working days for your ad to appear

That's comparable to most local newspapers. And why your ad can quickly appear in the next issue to start generating quality response.

Computerworld costs no more than local papers

And with a regional rate of just $199.42 per inch, your cost-per qualified candidate reached is better than any newspaper. Sunday, daily or trade. Or just about any other source, for that matter.

Computerworld leads candidates to your ad



Just look at this week's Computer Careers section. You'll find a career editorial topic that will stir the interest of virtually any computer job seeker — passive *or* active. It's just one of countless reasons *Computerworld* is America's newspaper of choice on computing. No matter how much the times change.

And while times may change, some things won't. Whether you *use* computers, *make* computers, or sell products and services *for* computers, *Computerworld* is still your major source of news today. And your major source of computer professionals tomorrow.

For more recruiting tips, call John Corrigan, Vice President/Classified Advertising, at 800/343-6474 (in MA, 508/879-0700).

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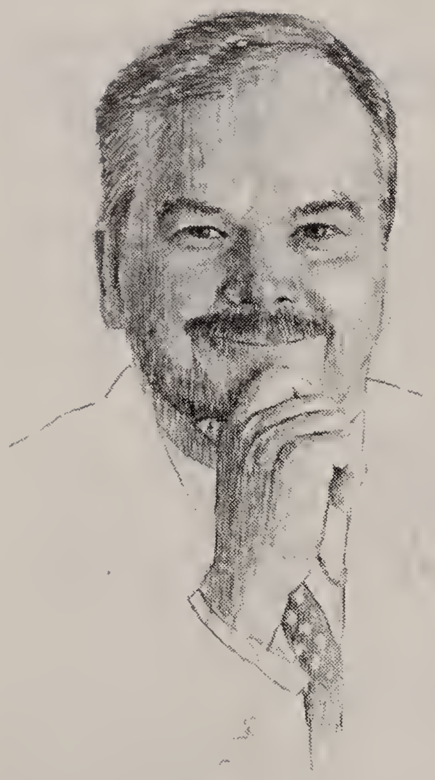

“In computer trade press advertising, Computerworld Direct Response Cards are first in quantity and quality - and lowest in cost per qualified lead.”

- Charles A. Mills
President
Firesign Computer Company

Firesign Computer Company is a data communications software developer with 17 years in the business. Having tripled in size during the past two years, this San Francisco-based company retains rep firms on the East Coast and in Europe to service a worldwide customer base that extends as far as Australia and New Zealand. For President Chuck Mills, finding new sales prospects for the company's flagship product Outbound means advertising in *Computerworld Direct Response Cards* every month.

"Outbound's claim to fame is unattended file transfer. Supporting MVS and VM mainframes and OS/2, DOS, and Windows PC networks, it is the only product whose main thrust is unattended mainframe-to-PC file transfer. Virtually invisible to the PC user, Outbound saves time, provides flexibility, and eliminates training - all while automatically ensuring consistent reliability.

"By its very nature, Outbound has a cross-industry and cross-functional appeal, with potential users ranging from mainframe network software managers to information center professionals to project analysts. So when it comes to targeting our audience, we need a broad-spectrum advertising vehicle with a broad reader base. It's no surprise, then, that *Computerworld Direct Response Cards* have proven to be our best choice.

"In computer trade press advertising, *Computerworld Direct Response Cards* are first in quantity and quality - and lowest in cost per qualified lead. They consistently generate over 70 responses every month - and a full two-thirds are very qualified leads. Some months, we've even received as many as 120 responses. On a cost-per-lead basis, *Computerworld Direct Response Cards* are also our best value dollarwise.

"As an added benefit, I see *Computerworld Direct Response Cards* having an equalizer effect. Here, unlike other advertising vehicles, companies with smaller advertising budgets like ours stand out and make just as big an impact as much larger companies. *Computerworld's* large circulation also gives us reach to the right cross-section of potential buyers. And, since we continue to receive responses for many weeks after each deck hits, we obviously benefit from both a long shelf life and an active pass-along readership.

"As long as *Computerworld Direct Response Cards* remain our top lead generator, we'll definitely maintain our advertising presence in every deck. Looking ahead, I also foresee expanding our *Computerworld Direct Response Card* advertising should we develop a new data communication software product requiring similar exposure."

Computerworld Direct Response Cards give you a cost-effective way to reach *Computerworld's* powerful buying audience of over 135,000 computer professionals. Every month. They're working for Firesign Computer Company - and they can work for you. Call Norma Tamburrino, National Account Manager, Computerworld Direct Response Cards, at (201)587-0090 to reserve your space today.

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PURCHASE *plight*

Experiences from the trenches based on 20/20 hindsight

BUYING SMART

By Joe Panepinto

The art of making a deal comes by way of experience. Only after you purchase do you learn how to do it right. While buying strategies for hardware and software depend on many things, the experiences of others can help streamline your negotiations. In the following examples, customers explain what they would have done differently.

20/20 Talk with other customers

Ramon Padilla, information systems manager for Jefferson County in Louisville, Ky., was not promised the moon, he was promised something worse — a voice-processing system that did not exist. Discussions with a salesman and an examination of the marketing literature on the system confused the features of two models of the system so badly that Padilla expected the system he ordered to have a combination of features that did not exist.

"I learned that the bill of goods a salesman sells you and the product that is delivered is not always the same thing," Padilla says. "I didn't talk to other people who already had one of these systems in place. They did a good snow job on me; what can I say?"

20/20 Have only one contact

A potentially more costly mistake almost occurred because the county had more than one point of contact for the project. Padilla placed a large order that included maintenance services, but he let his purchasing department negotiate the price. When the vendor called Padilla to deliver the equipment, it said it was charging for shipping costs. However, Padilla checked with purchasing and found that the shipping charges were included in the price. Leslie Tomac, IS manager at Source One in Denver, agrees. "Establish an honest relationship with more than one vendor that is competent" Tomac says. "Your single contact doesn't have to be a techie, but you do have to be able to rely on them."

Padilla has also found that when ordering from the larger mail-order houses, shipping charges are often negotiable. He now restricts his mail-order dealings to companies "that have been around a while and have a good return policy," he says. Depending on what is being delivered, he has managed to get shipping fees waived for orders under $1,000. "I haven't been burned by mail-order at all," Padilla says. "Maybe that's why I'm not afraid to hit the mail-order catalogs.'

20/20 Consult on-line services

You can also find good buying information on CompuServe forums. For instance, sometimes Padilla will post a question about a particular product; other times, he just reads the threads to find out about complaints customers have about certain vendors.

20/20 Do your own testing

Perhaps Shelton Levert, IS manager in the Cuyahoga County Prosecutor's Office in Cleveland, should start logging on to on-line services because he has had little luck asking vendors directly.

Levert recently purchased a bar-code system for file scanning without checking with offices that had similar systems. The vendor's pitch sounded good and its knowledge of the software and systems requirements was impressive, so Levert gave it the job. Once the system was in, however, Levert's users started to find problems with the system that the vendor had not mentioned.

"We learned only after the system was up and running some of the things a little homework would have helped us find — the ink on the labels rubbed off, there are different types of labels and wands that would have suited our purposes better, stuff like that," Levert says.

It has been a lesson well learned. Levert doesn't even trust other users of a system to give him accurate information.

"Someone tells you a product is good, and you trust them because you think they're knowledgeable," Levert says. "But it turns out they are only knowledgeable about one product — the one they are using."

Panepinto is a free-lance writer in Amherst, Mass.

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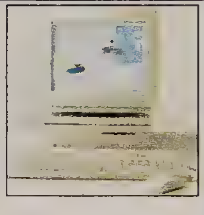

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Premium 386/33, 2mb ram, 320mb drive	$739R	$675R	$430
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Pawer Exec 386SL/25 Natebaak, 4mb ram, 120mb drive	$1099R	$1050R	$650
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DP 386/25, 5mb ram, 84mb drive, dual floppies, VGA	$549R	$495R	$275
DP 386/33L Mad 4mb ram, 120mb drive	$599R	$540R	$390
LTE Lite 386SL/25 Natebaak, 4mb ram, 120mb drive	$1699R	$1595R	$900
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8525 — C36 Calar 286/10, 30mb drive	$399R	$375R	$210
8550 — 031 286/10, 1mb ram, 30mb drive	$329R	$275R	$120
8580 — 041 386SX/16, 1mb ram, 44mb drive	$499N	$450N	$170
8590 — OLF 486DX2/50, 4mb ram, 400mb drive	$2399N	$2295N	$950
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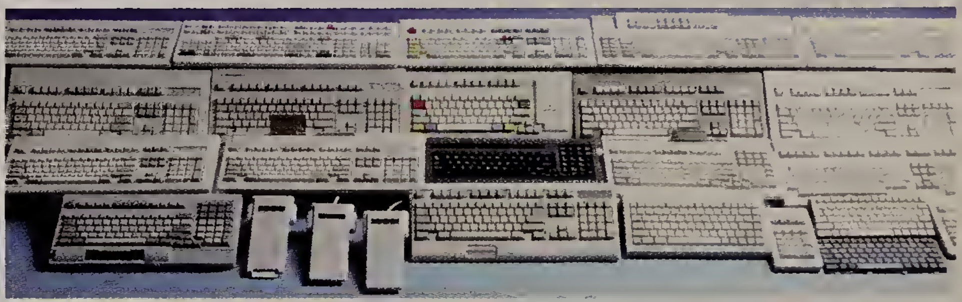

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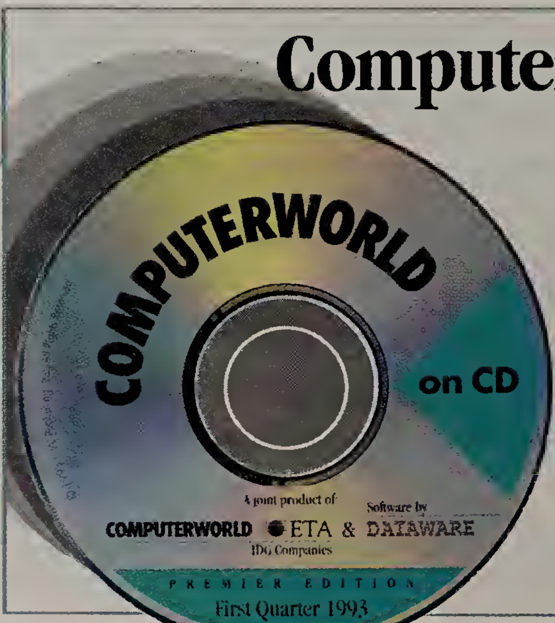

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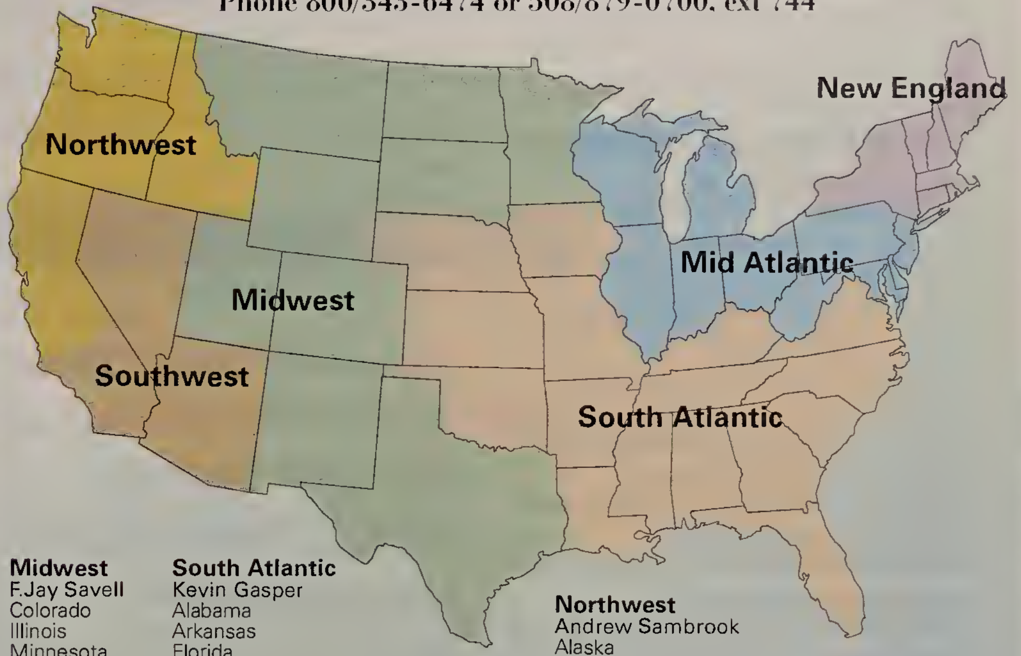

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PUBLISHER'S OFFICE: *Executive Assistant to the CEO/Publisher,* Karen Elliott *Assistant to Associate Publisher,* Lois Beninati **SALES:** *Display Advertising Production Manager,* Paula Wright, *Display Advertising Coordinator,* Peggy Hennessy **SALES CLASSIFIED:** *Vice-President Recruitment Advertising,* John Corrigan, *Recruitment Marketing Director,* Derek E. Hulitzky, *Product Classified Sales Manager,* Connie Martin Kearins, *Solutions Directory,* Nancy Whittaker, *Classified Operations Director,* Cynthia Delany **MARKETING:** *Director, Marketing Communications,* Mary Doyle, *Account Manager, Marketing Communications,* Elizabeth Phillips, *Manager, Trade Show & Conventions,* Audrey Shohan, *Marketing Communications Project Coordinator,* Susan Thaxter, *Administrative Assistant,* Patty White **CIRCULATION:** *Vice-President Circulation,* Gail Odeneal, *Director of Circulation Management,* Maureen Burke **PRODUCTION:** *Production Director,* Christopher P. Cuoco, *Production Manager,* Beverly Wolff **SYSTEMS:** *Vice President Information Systems,* Linda Nelson

Sales Offices

Associate Publisher/Senior Vice President Sales
Kevin McPherson
Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171 Phone: 508-879-0700, FAX: 508-879-0446

Northeast

Vice-President Eastern Advertising Sales/David Peterson, Senior District Managers/Bill Cadigan, Sherry Driscoll, John Watts, Sales Assistants/Alice Longley, Lisa Ikels, Tammy Gryniewicz, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 872-2915

Mid-Atlantic

Senior District Manager/Fred LoSapio, District Managers/Paula D'Amico, Rich Molden, Sales Assistants/Susan Kusnic, Jean Dellarobba, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090 FAX: (201) 712-9786

South Atlantic

Senior District Manager/Bernie Hockswender, Sales Assistant/Debra Brown, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758 FAX: (404) 255-5123

Midwest

District Manager/Sharon R. O'Brien, Sales Assistant/Denise Richards, 980 N. Michigan Avenue, Suite 1400, Chicago, IL 60611 (312) 214-3606 FAX: (312) 214-4962

Southwest

Senior District Manager/Darren Ford, Sales Assistant/Brenda Shipman, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882 FAX: (214) 385-1603

Northern California

Vice-President Western Advertising Sales: Richard Espinoza, Senior District Managers/Ernie Chamberlain, Kaye Sharbrough, Linda Holbrook, District Managers/Christine Curry, Elizabeth Cooper, West Coast Operations Manager/Leticia Lehane, Sales Assistants/Candace Splivalo, Emily Gaytan, Connie Sanchez, Denise Garcia, Andrea Zurek, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Southern California

Southwestern Regional Manager/Fran Cowen, Sales Assistant/Aileen Lim, 19800 MacArthur Blvd., Suite 500, Irvine, CA 92715 (714) 757-4123 FAX: (714) 757-4124

Custom Publications

Boston: Vice President/Larry Craven, Director of Publishing Services/Carolyn Novack, Sales Assistant/Heidi Schuberthan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (508) 879-0700 FAX: (508) 879-0446

San Francisco: Western Director/Michele Gerus, Sales Assistant/Nikki Wilson, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Client/Server Journal

Sherry Driscoll, 375 Cochituate Rd., Box 9171, Framingham, MA 01701-9171, (508) 879-0700 FAX (508) 872-2915, Kaye Sharbrough, 500 Airport Boulevard, Suite 400, Burlingame, CA 94010 (415) 347-0555 FAX: (415) 347-8312

Product Classified

Sales Manager/Connie Martin Kearins, New England Account Executive/Susan Cardoza, Mid-Atlantic Account Executive/Michelle Reeves, South-Atlantic Account Executive/Kevin Gasper, Midwest Account Executive/Jay Savell, Northwest Account Executive/Andrew Sambrook, Southwest Account Executive/Claude Garbarino, Solutions Directory/Nancy Whittaker, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474 FAX: (508) 875-3202

Recruitment Advertising Sales Offices

Vice President/Recruitment Advertising/John Corrigan, Marketing Director/Derek E. Hulitzky, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474
New England: Regional Manager/Nancy Percival, 375 Cochituate Rd., Framingham, MA 01701-9171 (800) 343-6474, Account Executive/Karen Lesko, (800) 343-6474

Mid-Atlantic: Regional Manager/Marty Finn, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090, Account Executive/Caryn Dlott, (800) 343-6474
South-Atlantic: Regional Manager/Katie Kress, 8304 Professional Hill Drive, Fairfax, VA 22031 (703) 573-4115, Sr. Account Executive/Pauline Smith (800) 343-6474

Midwest: Regional Manager/Pat Powers, 1011 East Touhy Avenue, Suite 550, Des Plaines, IL 60018 (708) 827-4433, Sr. Account Executive/Ellen Cross (800) 343-6474

West: Regional Manager/Barbara Murphy, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164, Sr. Account Executive/Christopher Glenn (800) 343-6474

Direct Response Cards

East: Account Manager/Norma Tamburrino, Mack Center 1, 365 West Passaic St., Rochelle Park, NJ 07662 (201) 587-0090

West: Account Executive/Jill Greer, 18008 Skypark Circle, Ste. 145, Irvine, CA 92714 (714) 250-0164

IDG International Marketing Services

President/Frank Cuttita, Eastern Advertising Manager/Veronique Lamarque, 187 Oaks Road, Framingham, MA 01701 (508) 879-0700

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Advertisers' Index

AMBRA Computer Corporation 45-49
Amdahl 78-79
Avalon 9
Borland International 17
Command Technology 15
Compaq Computer Corp. 18-19, 41-43
Computer Associates 3, 8, 66-67
CW Ancillary 36
CW Classified 20, 61
CW Editorial Calendar C3
Data General 75, 77
Dell 50
Digital Equipment Corp. 53-56, 62-63
IBM 25, 26-27, 29, 31, 33
Innovation Data Procesing 7
Lotus Development Corp. 21, 58-59
Micro Focus 11
NetworkWorld 64
Oracle Corp. 5
Powersoft C4
SAS Institute 70-71
SIM Technology Summit 82-83
Simware 61
Software Spectrum 20
Sun Microsystems 22-23
Sybase, Inc. 13
Toshiba 38-39
Windows World Open 80

This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.

Companies in this issue

Page number refers to page on which story begins

3Com Corp. ... 10,60

A

Aavid Engineering, Inc. ... 44
Acer America Corp. ... 51
Acustar Electrical ... 14
Adaptec Corp. ... 32
Administrative Conference of the United States ... 25
Alpha Software Corp. ... 72
Aluminum Co. of America ... 73
Amdahl Corp. ... 65,68
American Express Travel Related Services Co. ... 85
American Management Institute ... 76
Andersen Consulting ... 10
Apple Computer, Inc. ... 16,28,37,40,44,69
Applied Business Technology Corp. ... 40
Ashton-Tate Corp. ... 40
ASK Group, Inc. ... 10
Association for Systems Management ... 76
AST Research, Inc. ... 28,37
AT&T ... 1,16,28,40,73
Attar Software Ltd. ... 30
Avanti Software, Inc. ... 69

B

Barber-Colman Co. ... 14
Bellcore ... 69
Binar Graphics, Inc. ... 44
Bio Rad Laboratories, Inc. ... 14
Borland International, Inc. ... 6,16,37,40,72
Boston University's Center for Management Development ... 76

C

Cable Television Laboratories, Inc. ... 28
Cabletron Systems, Inc. ... 1,10
Cadence, Inc. ... 32
Caere Corp. ... 44
Cascade Communications Corp. ... 16
Center for Project Management ... 76
Chicago Christian Industrial League ... 12
Chicago Research and Planning Group ... 76
Chicago Stock Exchange ... 6
Chipcom Corp. ... 61
Chrysler Corp. ... 68
Cigna Corp. ... 30
Cincom Systems, Inc. ... 30
Cisco Systems, Inc. ... 16,60
Citicorp ... 28
Clevo Corp. ... 44
Comcast Corp. ... 28
Communications Network Architects, Inc. ... 4,57
Compaq Computer Corp. ... 1,4,28,44, ... 52,57,101
CompuServe, Inc. ... 40
Computer Associates International, Inc. ... 40,68,72,101,102
Computer Sciences Corp. ... 32
Comshare, Inc. ... 65
Connectronix Corp. ... 68
Conner Peripherals, Inc. ... 52
Conner Storage Systems ... 52
Convex Computer Co. ... 14
Corporation for National Research Initiatives ... 28
Cowen & Co. ... 101
Cyrix Corp. ... 32

D

Data General Corp. ... 51
Datapro Information Services Group ... 68
Dataquest, Inc. ... 10
Dell Computer Corp. ... 16,28,37
Delphi Consulting Group, Inc. ... 65
Department of Health and Human Services ... 1
Department of Justice ... 1
Digital Equipment Corp. ... 6,40,65,68,69,102
Direct Technology Ltd. ... 44
Display Technologies, Inc. ... 44
Documentum, Inc. ... 32
Dryer Grand Ice Cream, Inc. ... 14

E

E. I. DuPont de Nemours & Co. ... 73
Electronic Data Systems Corp. ... 68,102
Elf Atochem North America, Inc. ... 86
Elkay Manufacturing Corp. ... 86
Environmental Protection Agency ... 1
Ernst & Young ... 73
Exide Electronics Group, Inc. ... 52

F

Federal Sources, Inc. ... 32
Fiat SpA ... 102
Fisher Systems Consulting ... 14
Forrester Research, Inc. ... 28
Fujitsu Ltd. ... 68

G

Gartner Group, Inc. ... 4,6,15,20,60
General Services Administration ... 1
Global Training Technologies, Inc. ... 44
Globe Metalurgical, Inc. ... 73
GTE Corp. ... 73
GTE Telecommunications Products and Services ... 65
Gupta Corp. ... 68

H

Hewlett-Packard Co. ... 1,4,8,10,14,15,40,51 ... 61,68,69,85,102
Hitachi Data Systems Corp. ... 51
Hitachi America Ltd. ... 14,68
Hurwitz Consulting Group, Inc. ... 6

I

IBM ... 4,6,8,16,28,30,32,44,51,68,69,102
IBM Federal Systems Co. ... 32
IBM PC Co. ... 16,37,44
IBM's Integrated Systems Solutions Corp. ... 86
In-Focus Systems, Inc. ... 44
Information Builders, Inc. ... 68
Informix Corp. ... 1
Informix Software, Inc. ... 51
Ingres Corp. ... 32
Institute for Certification of Computer Professionals ... 76
Intel Corp. ... 6,28,57
International Data Corp. ... 6,15,32,37,68
ITT Datacom ... 52
IVI Travel, Inc. ... 14

J

JetForm Corp. ... 52

K

Kalock Corp. ... 44
Kendall Square Research Corp. ... 10,32

L

LANQuest Labs ... 60
Legacy, Inc. ... 72
Legent Corp. ... 20
Library of Congress ... 32
Loral Corp. ... 32
Los Angeles Regional Food Bank ... 1
Lotus Development Corp. ... 40,44,52
Lourdes Hospital ... 1
Lufthansa German Airlines ... 102

M

MapInfo Corp. ... 32
Marsh & McLennan ... 102
Massachusetts Mutual Life Insurance Co. ... 14
MCI Communications Corp. ... 40,52
Merrill Lynch & Co. ... 102
Meta Group, Inc. ... 65
Metamor Technologies Ltd. ... 6
Micro Focus, Inc. ... 30
Micrografx, Inc. ... 1
Microsoft Corp. ... 1,6,14,15,16,28,32 ... 40,51,52,65,68,69,72,101
Mile-High Information Services, Inc. ... 4
Mitsubishi Electric Corp. ... 14
Mitsui & Co. ... 68
Motif, Inc. ... 44
Motorola UDS ... 61
Motorola, Inc. ... 44,73,74

N

Nasdaq Stock Market, Inc. ... 68
National Security and Emergency Preparedness Office ... 25
National Weather Service ... 51
NCR Corp. ... 65
NEC Technologies, Inc. ... 44
NetGuard Systems, Inc. ... 52
New York Life Insurance Co. ... 37
New York's City Harvest ... 1
Nihon Unisys Ltd. ... 68
North Carolina Harvest ... 1
Norwest Mortgage, Inc. ... 57
Novell, Inc. ... 1,10,40,51,52,65,69,102
Nynex Corp. ... 28

O

Object Management Group ... 69
Office of Management and Budget's Legislative Reference Division ... 25
OK Industries, Inc. ... 6
Omicron ... 73
Open Software Foundation ... 4,8,51
Oracle Corp. ... 6,69
Orszagos Takarekpenztar ... 68

P

Pacific Bell ... 76
Pacific Monolithic ... 10
Paper Software, Inc. ... 102
Patti Roscoe and Associates, Inc. ... 4
PeopleSoft, Inc. ... 10
Pfizer, Inc. ... 73
Platinum Software Corp. ... 52
Policy Master PLC ... 30
PRC, Inc. ... 51
Price Waterhouse ... 37
Prime Computer, Inc. ... 51
Prism Solutions, Inc. ... 68
Project Bread ... 1
Project Management Institute ... 76

R

Reuters Holdings PLC ... 16
Rockwell International Corp. ... 85

S

Saint Agnes Medical Center ... 4
Second Harvest ... 1
Seiko-Epson Corp. ... 44
Sequent Computer Systems, Inc. ... 14,68
Share Our Strength ... 1
Sherwin-Williams Co. ... 65
Siemens/Nixdorf Informationssysteme AG ... 1,68
Silicon Graphics, Inc. ... 6,15,40
Southern California Edison Co. ... 60
Southwestern Bell Telephone Co. ... 30
Sprint Corp. ... 1
Standard Microsystems Corp. ... 57
Strategic Planning Institute's Council on Benchmarking ... 73
Stratus Computer, Inc. ... 14
Sun Microsystems Computer Corp. ... 40,68,69,101
Sun Microsystems, Inc. ... 4,8,15
Sybase, Inc. ... 57
Symantec Corp. ... 16,69
Syntex Corp. ... 32,86
SysKonnect, Inc. ... 52

T

T3Plus Networking, Inc. ... 60
Taligent, Inc. ... 69
Teknekron Software System ... 16
Telepartner International ... 61
Texas Commerce Bank ... 28
Texas Instruments, Inc. ... 32,73
The American Quality Foundation ... 73
The Coastal Corp. ... 14
The Failure to Thrive Clinic ... 1
The Olive Branch Mission ... 1
The Software Publishers Association ... 32
The Yankee Group ... 52
Tivoli Systems, Inc. ... 1,10
Toshiba America Information Systems, Inc. ... 44
Transocean Ltd. ... 1
Tricord Systems, Inc. ... 57
Twinhead International, Inc. ... 44

U

Union Central Life Insurance Co. ... 16
U.S. Department of Health and Human Services ... 32
U.S. Department of Housing and Urban Development ... 68
U.S. Geological Survey ... 51
Unilever PLC ... 4,8
Unisys Corp. ... 1,68
University of Texas M.D. Anderson Cancer Center ... 1

W

Wachovia Bank ... 15
Warren Suss Associates ... 1,25
Washington Gas Light Co. ... 40
Wellfleet Communications, Inc. ... 16,60
Wohl Associates ... 40
WordPerfect Corp. ... 69
WorkGroup Technologies, Inc. ... 51

X

XDB Systems, Inc. ... 68
Xerox Corp. ... 32,69

Z

Zeos International Ltd. ... 16

Friday Stock Ticker

Gainers

Losers

Percent

Gainers		Losers	
McAfee Associates	32.1	Inacom Corp.	-22.5
Allerion Inc.	26.9	CompUSA Inc.	-19.7
Easel Corp.	20.0	Kendall Square Research	-19.0
Computervision Corp.	19.2	Iomega Corp.	-17.3
American Software Inc. (L)	16.7	Weitek	-16.2
Network Computing Devices (L)	16.0	Cambex Corp.	-13.5
Policy Management Sys.	15.5	Software Toolworks Inc.	-12.5
Parallan Computer	14.9	Micro Focus	-12.1

Dollar

Gainers		Losers	
IBM	4.75	CompUSA Inc.	-4.63
Lotus Development	4.50	SynOpsys	-4.50
Compaq Computer Corp.	4.13	Inacom Corp.	-4.00
Matsushita Electronics	4.00	Progress Software Corp.	-3.75
Policy Management Sys.	4.00	Reynolds and Reynolds (H)	-3.00
3M Corp	4.00	Microage Inc. (H)	-2.50
Paychex	3.50	Boole & Babbage	-2.25
Zilog Inc.	3.25	PictureTel Corp.	-2.25

COMPAQ DISCONTINUED ITS UNPROFITABLE PRINTER BUSINESS THIS WEEK, WHILE 3COM CORP. CONFIRMED ITS EXCELLENT QUARTERLY RESULTS AND ANNOUNCED THE ACQUISITION OF SWITCHING TECHNOLOGY VENDOR SYNERNETICS.

Industry Almanac

The big score

If you put $1,000 into **Microsoft Corp.** (MSFT) stock on the last day of 1988, your holdings are worth about $7,250 today. Not bad.

Other leading information technology stocks have also done well in that five-year period, though most don't stack up to Microsoft's phenomenal returns. The same amount put into either **Computer Associates International, Inc.** (CA) or **Compaq Computer Corp.** (CMPQ), for example, would have yielded a gain of about $1,500.

Of course, in 1993 it is easy to pick Microsoft out of the 1988 pack, but hindsight nets nothing in real dollars. The challenge is to sort through the myriad current choices and pick out the big winner for the *next* five years.

Wall Street analysts said finding overall markets that have room for explosive growth is the first key; management teams and business fundamentals take a backseat. Despite Microsoft founder Bill Gates' business acumen, "we wouldn't be sitting here talking about Microsoft if the PC software market hadn't ballooned the way it did," said James Kedersha, vice president of institutional research at Cowen & Co.

"Obviously, though, it's a combination of things. Even in a great market, bad management can snatch defeat from the jaws of victory," Kedersha said.

—*Derek Slater*

Many happy returns

Microsoft's stock has dramatically outperformed many other big names in the industry during the past five years

Company	Investment 12/30/88	Current value
Microsoft Corp.	$1,000	$7,250
Computer Associates International, Inc.	$1,000	$2,588
Compaq Computer Corp.	$1,000	$2,495
Wordstar International, Inc.	$1,000	$514
IBM*	$1,000	$439

Current values calculated as of mid-December 1993

*IBM's current value does not include the stock's accumulated dividend for five years

Source: Nordby International, Inc., Louisville, Colo.

Communications and Network Services — UP 0.10%

Exch	52-Week Range			Dec. 17 3 PM	Wk Net Change	Wk Pct Change
OTC	47.75	19.63	3 COM Corp. (H)	47.75	2.88	6.4
NYS	91.13	69.88	American Info Techs Corp.	78.25	1.88	2.5
NYS	65.00	49.38	AT&T	54.63	-0.13	-0.2
OTC	4.44	0.94	Artel Communication Corp.	3.19	0.00	0.0
OTC	26.50	12.50	Banyan Systems Inc. (H)	25.38	-0.13	-0.5
NYS	69.13	49.25	Bell Atlantic Corp.	60.25	0.88	1.5
NYS	63.88	50.38	BellSouth Corp.	57.50	0.63	1.1
NYS	14.75	4.25	Bolt, Beranek & Newman	12.88	0.38	3.0
OTC	18.50	9.50	Brooktrout Technology	13.00	-0.75	-5.5
NYS	119.00	74.50	Cabletron Systems	110.88	-0.25	-0.2
OTC	36.50	11.25	Centigram Communications	36.00	2.50	7.5
OTC	55.50	25.25	Chipcom Corp.	45.00	1.38	3.2
OTC	62.25	35.88	Cisco Systems Inc.	60.13	0.88	1.5
OTC	18.38	8.00	Compression Labs Inc.	12.63	-0.50	-3.8
OTC	36.00	22.00	CrossComm	27.13	-2.13	-7.3
OTC	4.63	1.50	Data Switch Corp. (L)	1.69	-0.06	-3.5
OTC	11.75	3.50	Digital Systems Int'l Inc.	3.63	0.06	1.7
OTC	73.13	19.38	DSC Communications	57.88	-1.25	-2.1
OTC	9.50	4.75	Fibronix Int'l Inc.	5.13	0.00	0.0
OTC	4.38	1.75	Gandalf Technologies Inc.	2.56	-0.06	-2.4
OTC	2.06	0.69	Gateway Communications	0.91	0.03	3.5
NYS	15.75	5.63	General Datacomm Inds.	9.38	0.13	1.4
ASE	3.63	2.00	Go Video	2.69	-0.19	-6.5
NYS	39.88	33.75	GTE Corp.	35.88	0.13	0.3
NYS	94.75	69.00	ITT Corp.	93.00	0.00	0.0
OTC	29.88	18.81	MCI Commmunications Corp.	26.25	1.50	6.1
OTC	6.50	1.50	Microcom Inc.	4.63	-0.38	-7.5
OTC	24.25	3.50	Netrix Corp.	6.00	0.00	0.0
OTC	19.00	6.25	Network Computing Devices (L)	7.25	1.00	16.0
NYS	11.50	5.38	Network Equipment Tech.	8.88	-0.13	-1.4
OTC	20.13	8.00	Network General	16.75	1.25	8.1
OTC	13.50	6.88	Network Systems Corp.	8.50	-0.63	-6.8
OTC	73.88	19.13	Newbridge Networks Corp.	52.13	-0.75	-1.4
NYS	46.00	21.38	Northern Telecom Ltd.	29.38	-0.25	-0.8
OTC	35.25	17.00	Novell Inc.	20.00	-0.38	-1.8
NYS	48.88	40.31	Nynex Corp.	41.13	-0.50	-1.2
OTC	30.00	19.00	Octel Communications Corp.	27.00	1.75	6.9
OTC	6.13	3.75	Penril Data Comm Networks	6.13	0.06	1.0
OTC	30.50	14.50	PictureTel Corp.	18.25	-2.25	-11.0
OTC	11.50	3.63	Proteon Inc.	6.75	-0.50	-6.9
NYS	38.88	17.75	Scientific Atlanta Inc.	32.50	0.88	2.8
NYS	47.00	34.19	Southwestern Bell Corp.	43.13	0.50	1.2
NYS	40.25	25.13	Sprint Corp.	32.63	0.25	0.8
OTC	27.00	12.50	Standard Microsystems Corp.	25.75	0.88	3.5
OTC	19.75	10.25	Stratacom Inc.	16.75	-0.50	-2.9
OTC	42.75	20.00	Synoptics Communications	27.25	2.75	11.2
OTC	9.88	2.88	Telebit Corp.	7.13	0.00	0.0
OTC	17.88	5.13	Telematics Int'l Inc.	14.75	-1.00	-6.3
OTC	35.25	17.00	US Robotics	28.00	0.25	0.9
NYS	50.75	37.75	US West Inc.	46.50	0.13	0.3
OTC	65.00	29.50	Wellfleet Communications	62.25	-0.13	-0.2
OTC	19.50	7.25	Xircom	14.50	-1.00	-6.5

PCs and Workstations — UP 3.56%

Exch	52-Week Range			Dec. 17 3 PM	Wk Net Change	Wk Pct Change
OTC	5.56	2.50	Advanced Logic Research	3.25	-0.13	-3.7
OTC	65.25	22.00	Apple Computer Inc.	29.63	1.38	4.9
OTC	25.50	12.75	AST Research Inc.	23.25	1.25	5.7
NYS	7.75	2.50	Commodore Int'l	3.38	0.00	0.0
NYS	74.50	41.75	Compaq Computer Corp.	74.50	4.13	5.9
OTC	49.88	13.50	Dell Computer Corp.	24.63	1.63	7.1
NYS	89.25	64.38	Hewlett Packard Co.	77.88	3.25	4.4
NYS	23.38	11.75	Silicon Graphics	22.75	0.56	2.5
OTC	41.00	21.13	Sun Microsystems Inc.	27.00	0.50	1.9
NYS	48.13	24.63	Tandy Corp.	48.13	1.63	3.5
OTC	7.00	2.50	Zeos International Ltd.	3.75	0.25	7.1

Large Systems — UP 0.42%

Exch	52-Week Range			Dec. 17 3 PM	Wk Net Change	Wk Pct Change
ASE	8.50	4.38	Amdahl Corp.	6.63	0.50	8.2
NYS	8.75	3.63	Convex Computer	6.00	0.75	14.3
OTC	5.13	2.13	Cray Computer	2.13	-0.13	-5.6
NYS	30.88	20.38	Cray Research Inc.	25.75	-0.38	-1.4
NYS	13.88	7.75	Data General Corp.	8.63	-0.75	-8.0
NYS	49.25	30.38	Digital Equipment Corp.	35.38	0.38	1.1
NYS	47.38	32.88	Harris Corp.	45.50	-0.63	-1.4
NYS	59.63	40.63	IBM	59.63	4.75	8.7
OTC	25.75	5.25	Kendall Square Research	5.88	-1.38	-19.0
NYS	141.50	87.00	Matsushita Electronics	138.50	4.00	3.0
OTC	23.75	12.75	NetFrame	16.25	-1.00	-5.8
OTC	26.00	9.25	Parallan Computer	14.50	1.88	14.9
OTC	23.25	9.50	Pyramid Technology	14.25	1.00	7.5
OTC	24.00	11.25	Sequent Computer Sys.	14.50	-1.38	-8.7
OTC	6.00	1.38	Sequoia Systems Inc.	4.25	0.00	0.0
NYS	41.25	20.25	Stratus Computer Inc.	29.13	-0.38	-1.3
NYS	16.88	8.50	Tandem Computers Inc.	10.38	-0.88	-7.8
OTC	28.50	10.63	TriCord Systems	26.50	-0.75	-2.8
NYS	13.88	9.88	Unisys Corp.	12.75	1.38	12.1

Software — UP 0.82%

Exch	52-Week Range			Dec. 17 3 PM	Wk Net Change	Wk Pct Change
OTC	37.00	14.88	Adobe Systems Inc.	21.50	-0.38	-1.7
OTC	25.25	12.50	Aldus Corp.	23.38	1.50	6.9
OTC	9.25	5.13	American Software Inc. (L)	6.13	0.88	16.7
OTC	28.13	9.50	Ask Computer Systems	14.25	0.00	0.0
OTC	56.75	37.00	Autodesk Inc.	44.00	0.50	1.1
OTC	6.50	2.38	Bachman Info. Systems	2.94	-0.06	-2.1
OTC	42.00	24.00	BGS Systems Inc.	26.25	0.50	1.9
OTC	84.13	38.75	BMC Software Inc.	49.00	0.50	1.0
OTC	28.25	20.38	Boole & Babbage	24.00	-2.25	-8.6
OTC	27.25	12.75	Borland Int'l Inc.	15.50	0.50	3.3
OTC	4.63	2.75	CE Software	3.56	0.19	5.6
ASE	40.25	16.41	Cheyenne Software Inc.	29.63	-0.38	-1.3
OTC	19.58	8.25	ChipSoft (H)	17.13	-0.13	-0.7
OTC	10.75	5.63	Cognos Inc. (H)	10.38	0.50	5.1
NYS	44.25	19.50	Computer Associates	40.13	-0.50	-1.2
NYS	6.50	2.13	Computervision Corp.	3.88	0.63	19.2
OTC	34.25	19.25	Compuware Corp.	26.00	-1.00	-3.7
OTC	14.25	5.75	Comshare Inc.	10.75	0.63	6.2
OTC	20.38	5.38	Corel Corp.	19.50	0.50	2.6
OTC	15.25	3.63	Easel Corp.	4.50	0.75	20.0
OTC	23.00	8.75	Filenet Corp.	18.50	-1.25	-6.3
OTC	25.25	15.75	4th Dimension	20.50	-0.50	-2.4
OTC	19.25	5.25	Frame Technology	8.88	-0.88	-9.0
OTC	17.50	8.00	Group I Software	8.00	-1.00	-11.1
OTC	35.25	13.50	Gupta	16.75	0.63	3.9
OTC	12.00	5.25	Hogan Systems Inc.	9.25	-0.50	-5.1
OTC	27.75	11.25	IMRS	25.75	1.50	6.2
OTC	44.75	27.00	Information Resources	38.50	-0.25	-0.6
OTC	27.25	13.38	Informix Corp.	18.75	-0.13	-0.7
OTC	14.00	8.50	Intergraph Corp.	9.50	-0.38	-3.8
OTC	13.63	4.88	Interleaf Inc.	6.88	-0.13	-1.8
OTC	15.25	4.75	Intersolv Inc.	10.25	0.00	0.0
OTC	18.75	7.75	Knowledgeware Inc.	18.50	0.25	1.4
OTC	54.75	15.50	Legent Corp.	23.00	-0.25	-1.1
OTC	56.50	18.75	Lotus Development	56.50	4.50	8.7
OTC	23.00	4.25	MathSoft	6.25	0.50	8.7
OTC	20.25	4.50	McAfee Associates	9.25	2.25	32.1
OTC	11.63	4.38	Meca Software	6.38	0.00	0.0
OTC	15.50	7.63	Mentor Graphics (H)	14.63	0.75	5.4
OTC	46.00	13.63	Micro Focus	13.63	-1.88	-12.1
OTC	13.25	4.38	Micrografx Inc.	8.88	0.13	1.4
OTC	98.00	70.38	Microsoft Corp.	80.00	-1.38	-1.7
OTC	37.75	9.44	Oracle Corp. (H)	34.88	-0.75	-2.1
OTC	44.75	22.50	Parametric Technology	39.75	-0.25	-0.6
OTC	40.50	23.50	PeopleSoft	31.00	1.63	5.5
OTC	7.13	3.50	Phoenix Technologies	3.88	0.00	0.0
OTC	40.00	22.00	Powersoft	36.25	1.88	5.5
OTC	39.75	13.50	Platinum Software	27.25	-1.63	-5.6
OTC	25.00	7.25	Platinum Technology	9.75	0.38	4.0
OTC	60.25	32.25	Progress Software Corp.	47.25	-3.75	-7.4
OTC	4.50	1.94	Quarterdeck Office Sys.	2.13	0.00	0.0
OTC	32.00	16.00	Rainbow Technologies Inc.	17.25	-0.63	-3.5
OTC	11.38	4.25	Rasterops	7.25	-0.13	-1.7
OTC	15.25	6.50	Ross Systems	6.63	-0.88	-11.7
OTC	28.75	18.00	Sapiens Intl. Corp. N.V.	19.75	0.00	0.0
OTC	14.50	5.50	Software Publishing Corp.	7.75	-0.63	-7.5
OTC	17.25	6.38	Software Toolworks Inc.	9.63	-1.38	-12.5
OTC	2.88	0.75	Spinnaker Software	1.94	-0.19	-8.8
OTC	13.75	6.75	State of the Art	7.00	0.13	1.8
NYS	33.63	17.63	Sterling Software Inc.	26.75	0.00	0.0
OTC	21.63	9.63	Struct. Dynamics Research	17.13	0.75	4.6
OTC	43.50	21.00	Sybase Inc.	42.50	2.00	4.9
OTC	20.50	9.25	Symantec Corp.	16.00	0.25	1.6
OTC	25.50	10.00	System Software Assoc.	15.50	1.50	10.7
OTC	6.50	2.88	Trinzic Corp.	5.25	-0.50	-8.7
OTC	26.50	13.50	ViewLogic Systems	20.63	0.63	3.1
OTC	22.00	5.50	Walker Interactive Systems	9.63	-0.38	-3.8
OTC	3.19	0.84	Wordstar	1.25	0.06	5.2

Semiconductors — UP 0.06%

Exch	52-Week Range			Dec. 17 3 PM	Wk Net Change	Wk Pct Change
NYS	32.88	17.00	Advanced Micro Devices	18.00	0.50	2.9
NYS	28.00	14.88	Analog Devices Inc.	22.25	0.50	2.3
OTC	38.63	15.38	Atmel Corp.	30.13	0.75	2.6
OTC	6.88	2.75	Chips and Technologies	5.25	-0.56	-9.7
OTC	39.75	13.00	Cirrus Logic	34.13	-1.75	-4.9
NYS	16.75	8.63	Cypress Semiconductor Corp.	13.25	1.00	8.2
NYS	19.00	11.75	Dallas Semiconductor	14.88	1.63	12.3
OTC	74.50	42.50	Intel Corp.	57.75	1.50	2.7
NYS	19.25	10.25	LSI Logic Corp.	14.13	0.50	3.7
OTC	26.75	12.25	Lattice Semiconductor	13.38	0.13	0.9
NYS	63.63	18.13	Micron Technology	46.38	-0.63	-1.3
NYS	107.50	48.75	Motorola Inc.	88.50	-0.75	-0.8
NYS	21.75	10.13	National Semiconductor	15.00	0.25	1.7
OTC	14.50	6.50	Sierra Semiconductor	7.88	-0.50	-6.0
OTC	52.75	25.75	SynOpsys	42.00	-4.50	-9.7
NYS	84.25	45.25	Texas Instruments	60.75	1.50	2.5
OTC	18.88	6.50	VLSI Technology	10.25	-0.25	-2.4
OTC	14.38	4.88	Weitek	7.75	-1.50	-16.2
ASE	10.38	3.63	Western Digital Corp.	9.88	0.38	3.9
OTC	54.50	22.25	Xilinx	45.50	-1.50	-3.2
OTC	40.75	19.00	Zilog Inc.	30.50	3.25	11.9

Peripherals and Subsystems — UP 1.08%

Exch	52-Week Range			Dec. 17 3 PM	Wk Net Change	Wk Pct Change
OTC	24.75	10.50	American Power Conversion	20.75	1.50	7.8
OTC	23.50	15.50	Banctec Inc.	23.50	0.50	2.2
OTC	17.00	3.50	Cambex Corp.	4.00	-0.63	-13.5
ASE	18.38	3.88	Cognitronics Corp.	4.75	-0.25	-5.0
NYS	25.50	9.00	Conner Peripherals	13.75	0.75	5.8
OTC	38.50	17.50	Creative Technologies Inc.	28.50	2.50	9.6
OTC	30.75	6.50	Data Race Inc.	10.75	1.00	10.3
ASE	12.50	7.50	Dataram Corp.	8.75	-0.50	-5.4
NYS	19.50	4.88	EMC Corp.	15.63	0.13	0.8
OTC	10.50	5.25	Emulex Corp.	6.38	-0.13	-1.9
OTC	20.00	14.00	Evans & Sutherland	17.00	-0.63	-3.5
OTC	18.75	7.50	Exabyte	16.75	-1.00	-5.6
OTC	34.00	13.66	Intelligent Info. Systems	26.00	1.88	7.8
OTC	8.25	2.50	Iomega Corp.	2.69	-0.56	-17.3
OTC	12.50	5.75	IPL Systems Inc.	8.75	0.50	6.1
OTC	24.00	13.75	Komag Inc.	16.50	0.75	4.8
OTC	15.50	4.38	Maxtor Corp.	6.00	0.00	0.0
OTC	9.88	5.75	Micropolis Corp.	6.50	-0.25	-3.7
NYS	117.00	97.25	3M Corp	111.75	4.00	3.7
OTC	8.00	4.00	Printronix Inc.	7.63	-0.38	-4.7
NYS	17.25	7.50	QMS Inc.	9.38	0.13	1.4
OTC	17.88	9.38	Quantum Corp.	13.63	0.38	2.8
OTC	9.13	3.13	Radius Inc.	7.00	0.00	0.0
NYS	17.75	11.75	Recognition Equipment	14.75	0.13	0.9
OTC	12.75	3.63	Rexon Inc.	5.38	0.63	13.2
OTC	25.13	13.13	Seagate Technology	21.50	1.13	5.5
NYS	45.00	18.00	Storage Technology	32.75	1.38	4.4
NYS	27.88	19.13	Tektronix Inc.	23.00	1.25	5.7
NYS	90.00	69.88	Xerox Corp. (H)	87.88	-0.50	-0.6

Services — UP 0.01%

Exch	52-Week Range			Dec. 17 3 PM	Wk Net Change	Wk Pct Change
NYS	4.38	1.63	Allerion Inc.	4.13	0.88	26.9
OTC	23.75	14.88	American Mgmt. Systems	19.88	2.00	11.2
NYS	4.63	2.38	Anacomp Inc.	4.13	0.25	6.5
OTC	23.84	15.00	Analysts Int'l	16.75	-1.50	-8.2
NYS	56.50	46.88	Auto Data Processing	55.63	0.38	0.7
NYS	19.88	13.00	Ceridian Corp.	18.25	-0.38	-2.0
NYS	21.00	13.13	Comdisco Inc.	18.25	-0.63	-3.3
OTC	13.38	6.16	Computer Horizons	11.50	-0.25	-2.1
NYS	100.25	70.00	Computer Sciences	96.00	-0.13	-0.1
NYS	9.00	6.00	Computer Task Group	6.75	-0.25	-3.6
NYS	37.00	18.88	CompUSA Inc.	18.88	-4.63	-19.7
OTC	14.13	8.75	Control Data Systmes Inc.	10.00	-0.38	-3.6
OTC	16.00	7.00	Corporate Software	14.75	-0.13	-0.8
OTC	11.25	6.63	Egghead Discount Software	9.25	-0.25	-2.6
NYS	35.88	26.00	General Motors E (EDS)	27.75	0.38	1.4
OTC	25.50	13.75	Inacom Corp.	13.75	-4.00	-22.5
OTC	27.63	12.00	Intelligent Electronics	24.50	-0.13	-0.5
OTC	18.13	9.75	Merisel (H)	17.88	1.00	5.9
OTC	38.50	7.00	Microage Inc. (H)	34.50	-2.50	-6.8
OTC	37.75	21.50	Paychex	35.50	3.50	10.9
NYS	87.25	21.63	Policy Management Sys.	29.88	4.00	15.5
NYS	44.75	24.13	Reynolds and Reynolds (H)	41.25	-3.00	-6.8
OTC	25.75	13.38	SEI Corp.	25.25	-0.25	-1.0
OTC	26.00	17.50	Shared Medical Systems	24.00	1.38	6.1
OTC	12.63	5.75	SHL Systemhouse	6.63	0.00	0.0
OTC	30.75	20.00	Software Spectrum Inc.	22.00	-0.75	-3.3
OTC	42.75	28.00	Sungard Data Systems	35.25	0.75	2.2

KEY: (H) = New annual high reached in period (L) = New annual low reached in period

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Wysiwyg

Great Names

William Gates
Assistant controller
Administrator of information systems
Academy of Motion Picture Arts and Sciences
Beverly Hills, Calif.

Match the item on the left with its code name on the right

A	Taligent, Inc.'s object-oriented operating system	*Able*
B	Motorola, Inc.'s planned PDA offering	*Snowball*
C	Louis Gerstner's code name when he was on the nomination list for the top IBM job	*Alarm Clock*
D	Apple's next-generation PowerBook	*Pink*
E	Computer Associates' CA-Visual Objects for Clipper	*Aspen*
F	Microsoft Corp.'s upcoming Windows for Workgroups upgrade	*Blackbird*

From the classifieds in the Gulf Coast Newspaper (Alabama):

PACKARD BELL
COMPUTER 43
Mega & Byte hard
drive w/floppy disk.
VGA screen w/printer.
$750
Or Best Offer!

(Not only a mega and byte drive, but a screen that prints, too! Can you beat that!)

New Viruses

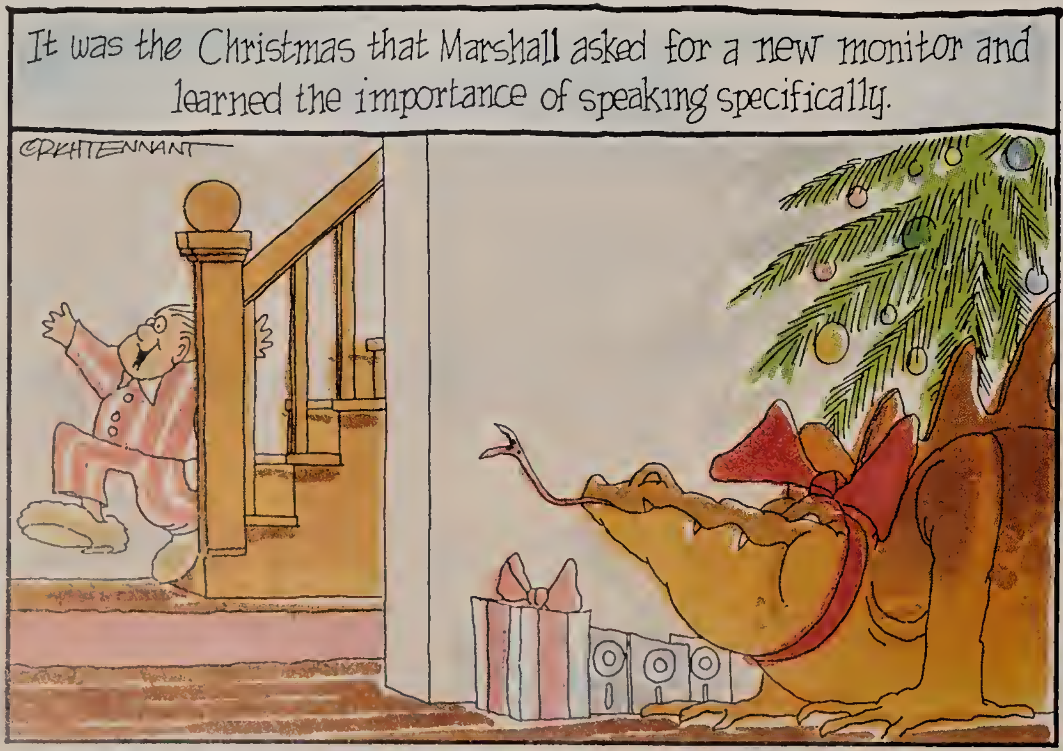
Mario Cuomo Virus
It would be a great virus, but it refuses to run.

Source: *High Tech Joke Book*
(Oak Ridge Public Relations, Inc.)

Answers: A: Pink; B: Alarm Clock; C: Able; D: Blackbird; E: Aspen; F: Snowball.

Illustrations by Dave Marshall

The 5th Wave *by* Rich Tennant


It was the Christmas that Marshall asked for a new monitor and learned the importance of speaking specifically.

Inside Lines

From the bottom to the top

Digital plans a January/February introduction of low-end Alpha AXP workstations that were held back from the company's last big hardware rollout in October. The DEC 3000 Model 300LX and 300X machines will be clock-speed upgrades of Digital's existing machines with a 10% performance bump and similar pricing. On a grander scale, Digital is looking to ship a four-processor superserver in the spring and then, in late 1994, to bring out new versions of its data center Alpha machines supporting 12 processors, up from a six-processor limit on the current models. The data center systems would be based on a second-generation Alpha microprocessor.

Dropping the UnixWare ball

Novell evidently lost a potential UnixWare customer — a major oil company that acted as a beta site — through lack of follow-up once the beta testing was over. "They dropped us like a hot potato. They wouldn't even send us a release version, as Microsoft did for NT," said an IS manager who participated in the beta test. "It's pretty sad; the full-blown server edition was nice, even if the desktop was not so good." The company may reconsider if Novell finally brings adequate performance for Windows applications running on UnixWare, as its newly released UnixWare 1.1 is said to do.

Unicenter driven

Fiat SpA, the Torino, Italy, carmaker, is finalizing an enterprise-wide licensing agreement with Computer Associates that financial analysts placed in the $10 million to $20 million range. Fiat will buy up to 500 copies of CA-Unicenter for its Hewlett-Packard HP 9000, Sun servers and IBM RS/6000 Unix machines. Sanjay Kumar, CA executive vice president of operations, mentioned the contract, slated for completion by year's end, to a group of financial analysts at a CA briefing last week. CA and Fiat declined to comment on the deal.

Airing IT out

Lufthansa German Airlines has selected Electronic Data Systems as the finalist in its outsourcing negotiations. Lufthansa, based in Cologne, could not be reached last week, but EDS said it hopes to sign a deal by early in the first quarter of 1994. EDS declined to elaborate on the shape or size of the project. Merrill Lynch analyst Steve McClellan estimated the potential value at $2 billion.

Changing its policy

The latest outsourcing evaluation of note comes from the hallowed halls of the insurance industry. Insurance companies have by and large been uninviting to outsourcers. But New York-based Marsh & McLennan, a $2 billion-plus outfit, could change all that. The insurance and reinsurance firm is in the midst of deciding whether to hand over control of its IBM mainframe and AS/400 shop.

No paper tiger

Paper Software, Inc., a tiny start-up that has licensed its graphical interface technology to IBM for use with its PC DOS product, is working on another GUI product that allows Macintosh users to seamlessly run Windows applications. In a brief beta version demonstration, Windows applications appeared to suffer no performance degradation.

The ever-sprawling Internet has found its way to the North Pole. That's right, now even St. Nick has an Internet address: santa.@north.pole.org. Children around the world are encouraged to send traditional holiday messages from their homelands to the on-line Mr. Claus, who has promised to reply. Santa's elves, who said Santa's biggest challenge right now is preparing an on-time, bug-free release of Christmas, intend to use the incoming greetings to compile a database of Christmas cheer messages. Phone, fax or CompuServe News Editor Alan Alper with news tips at (800) 343-6474, (508) 875-8931 or 76537,2413, respectively. Or try Computerworld's *24-hour voice-mail tip line at (508) 820-8555.*

Computerworld Editorial (January-June, 1994)

Issue Dates	Ad Closings		Editorial Features	Show Distribution	Ad Readership Study Issue	Response Card Deck
	Color*	B&W				
Dec. 27 & Jan. 3	Dec. 10	Dec. 17	**Special Edition:** Annual Forecast Issue			
Jan. 10	Dec. 24	Dec. 31	**Closer Look:** Object Database Management Systems		Starch	Mails: Jan. 12 Close: Dec. 11
Jan. 17	Dec. 31	Jan. 7	**CW Guide To: Spreadsheets and Spreadsheet Utilities** The New Capabilities *Buyers' Satisfaction Scorecard:* Windows Packages from Borland, Lotus, Microsoft, etc. *Firing Line:* Latest Windows Offering			
Jan. 24	Jan. 7	Jan. 14	**Closer Look:** ATM	**ComNet** Washington D.C., 1/25 - 1/27		
Jan. 31	Jan. 14	Jan. 21	**CW Guide To: Departmental Servers and Superservers** Matching a System to Departmental Needs (including Alpha, Tricord, Netframe, Sun, RS/6000, NCR, Sequent, Wyse, Compaq) *Buyers' Satisfaction Scorecard:* Leading RISC Servers *Firing Line:* Latest Server Product	**Executive Technology Summit** Tarpon Springs, Florida 2/2 - 2/4		
February		Dec. 27	**CLIENT/SERVER JOURNAL**	All Shows Feb. - April	Harvey	
Feb. 7	Jan. 21	Jan. 28	**Special Quarterly Report:** Re-engineering the Workplace		Starch	Mails: Feb. 9 Close: Jan. 3
Feb. 14	Jan. 28	Feb. 4	**CW Guide To: Management Tools for Large Networks** What Works When Systems are Distributed *Buyers' Satisfaction Scorecard:* Multivendor Network Management Software from DEC, HP, IBM,Sun, etc. *Firing Line:* Latest Management Package	**Networks Expo** Boston, 2/15 - 2/17		
Feb. 21	Feb. 4	Feb. 11	**Closer Look:** Windows and OS/2 Imaging Software			
Feb. 28	Feb. 11	Feb. 18	**CW Guide To: Work Flow Software** The Reality Behind the Promises *Buyers' Satisfaction Scorecard:* Leading Work Flow Software Systems *Firing Line:* Latest Work Flow Managers	**GroupWare '94** Boston, 2/28 - 3/3		
Mar. 7	Feb. 18	Feb. 25	**Closer Look:** Desktop Laser Printers		Starch	Mails: Mar. 9 Close: Jan. 31
Mar. 14	Feb. 25	Mar. 4	**CW Guide To: RAID** Choosing Among the Various Levels of Disk Array Technology *Buyers' Satisfaction Scorecard:* Leading Server-based RAID Systems *Firing Line:* Latest Mainframe RAID Subsystem			
Mar. 21	Mar. 4	Mar. 11	**Closer Look:**Unix Workstations	**UniForum** San Francisco, 3/23 - 3/25		
Mar. 28	Mar. 11	Mar. 18	**CW Guide To: Wireless Networks** The Spectrum of Technologies, Including LANs, WANs and Radio Frequency *Buyers' Satisfaction Scorecard:* Leading Wireless LANs *Firing Line:* Wireless Services Product			
Apr. 4	Mar. 18	Mar. 25	**Closer Look:** Personal Productivity Software			
Apr. 11	Mar. 25	Apr. 1	**CW Guide To: NT vs. OS/2 vs. Unix** Desktop and Server Choices *Buyers' Satisfaction Scorecard:* Leading Server Operating Systems from IBM, Microsoft , Sun, etc. *Firing Line:* Latest Desktop Operating Systems from a Leading Vendor		Starch	Mails: April 13 Close: Mar. 17
Apr. 18	Apr. 1	Apr. 8	**Management Special:** IS Architecture in Times of Change	**AIIM** New York 4/18 - 4/21 **SIM Conference** Florida, 4/20 - 4/22		
Apr. 25	Apr. 8	Apr. 15	**CW Guide To: Data Access Tools** New Tools for Quick Access to Data Buried in Older Flat-file and Hierarchical Databases *Buyers' Satisfaction Scorecard:* Leading SQL-based Data Access Tools *Firing Line:* Latest Data Access Tool from a Leading Vendor			
May		Mar. 30	**CLIENT/SERVER JOURNAL**	All Shows May - July	Harvey	
May 2	Apr. 15	Apr. 22	**Closer Look:** Distributed Computing Environment	**Interop + Networld** Las Vegas, 5/2 - 5/6		
May 9	Apr. 22	Apr. 29	**CW Guide To: Mobile Computing** From Notebooks to PDAs *Buyers' Satisfaction Scorecard:* Leading Notebook Computers *Firing Line:* Latest Sub-notebook Product from a Leading Vendor	**International DB2 Users Group** San Diego, 5/8 - 5/12		Mails: May 11 Close: April 14
May 16	Apr. 29	May 6	**Special Quarterly Report:** Re-engineering the Workplace		Starch	
May 23	May 6	May 13	**Windows World Open Supplement** **CW Guide To: The Impact of OLE 2.0** What OLE can do for IS and How to Make Sure Your Favorite Desktop Software Vendor is Up to Speed *Buyers' Satisfaction Scorecard:* Leading OLE Applications *Firing Line:* Latest OLE Development Tool	**Windows World** **Comdex Spring** Atlanta, 5/23 - 5/26 **DB Expo** San Francisco, 5/24 - 5/27		
May 30	May 13	May 20	**Annual Job Satisfaction Survey** How IS Professionals and Managers Really Feel About Their Jobs and Careers			
June 6	May 20	May 27	**CW Guide To: Distributed DBMS** Selecting the Right Engine for a Distributed Database Architecture *Buyers' Satisfaction Scorecard:* Leading Relational DBMS *Firing Line:* Latest Relational DBMS Product	**Computerworld Smithsonian Awards** Washington, DC		Mails: June 8 Close: May 2
June 13	May 27	June 3	**Closer Look:** AS/400		Starch	
June 20	June 3	June 10	**CW Guide To: Mainframes** How Big Iron Vendors are Answering the Challenges of the Mainframe's Changing Role *Buyers' Satisfaction Scorecard:* Leading Mainframes from Amdahl, HDS, IBM, etc. *Firing Line:* Latest Mainframe Model			
June 27	June 10	June 17	**Closer Look:** PCMCIA Cards	**PC Expo** New York, NY, 6/28 - 6/30		

Editorial contacts (508) 879-0700 CW Guide: The Guide includes a package of articles on the stated topic, in addition to Buyers' Scorecard and Firing Line
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